Exhibit H

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DIVISION 1 – GENERAL REQUIREMENTS

SECTION 011005
CONSTRUCTION EXECUTION AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section involves procedures for the following:

1. Specification format.
2. The Contractor's on-site staff requirements.
3. Use of the Project Site.
4. Hours of operation.
5. Project planning and controls.
6. Coordination meetings.
7. Government-furnished items.
8. Field engineering.
9. Protection.
10. Cutting and patching.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

1.03 DEFINITIONS

A. Cutting and Patching: Includes the cutting into or removal of existing installations of work and subsequent patching or replacement for inspection access or installation of other work or facilitate alterations or modifications to other work.

B. For all terms not understood, request immediate clarification.

1.04 SUBMITTALS

A. The Contractor shall submit, in accordance with Section 013305, *Construction Submittals*, the following:

1. Organization Chart: Thirty (30) days prior to Site mobilization, submit Project organization charts to the Project Director/COR, as required.
2. Staff Resumes: Submit resumes of principal staff as identified on the organization chart.

3. Staff Qualifications: Submit documentation confirming staff qualifications where such documentation is required by Sections B-J of the Contract and other Division 1 Specifications.
4. Confirm Property Survey (if applicable): See Field Engineering.
5. Site Utilization Plan: Submit within 30 days after the design is issued for construction. Failure to do so is basis for withholding progress payment.
6. Surveyor's Log (if applicable): Submit to the Project Director/COR weekly, or upon request.
7. Final Property Survey (if applicable): Submit prior to Substantial Completion.
8. Coordination Drawings: Submit in accordance with shop drawing submittal procedures described in Section 013305, *Construction Submittals*.
9. Ninety (90) Day Look-Ahead Projection:
   a. Initial ninety (90) Day Look-Ahead Projection: Thirty (30) days prior to mobilization, submit a list of entities anticipated to perform work within a ninety (90) day look-ahead timeframe at the Project Site.
   b. Monthly ninety (90) Day Look-Ahead Projection: At thirty (30) day intervals thereafter and through the end of the Project, update and resubmit this list to the Project Director/COR. The window of consideration for each update shall be a ninety (90) day look-ahead from the time of the submittal.
10. Occurrence Report: Submit to the Project Director/COR within twenty-four (24) hours of each occurrence.

1.05 GENERAL EXPLANATIONS

A. Specification Format: These Contract Specifications are organized, titled, and numbered in MasterFormat 2004, as prepared and maintained by the Construction Specification Institute (CSI), and adapted by OBO. OBO project technical specifications are numbered between Divisions 02 and 33, with some divisions in that range not used by the industry or OBO.

1. Abbreviated language, where used, may imply additional words and these will be interpreted as included where appropriate. Where required for proper context in Contract document interpretations, singular words will be deemed plural and plural words will be deemed singular.
2. Imperative language is used to describe Contractor performed work. At certain locations in the Contract documents, subjective language is used to describe responsibility fulfilled indirectly by the Contractor, as noted, or by others.
3. The colon (:) is used, in each related context, to indicate "means," "shall be," "is defined as," or similar implied terminology for abbreviated text.

B. Minimums vs. Maximums:

1. Except as otherwise specifically noted, the level of quality and quantity indicated represents the minimum for the performance of work (Refer questionable instances of applicability to the Project Director/COR for clarification).
2. The work as performed may comply exactly with minimums or maximums within specified or industry-accepted tolerances or may exceed minimums or fall below maximums within reasonable limits, as acceptable to the Project Director/COR. In general, maximum numeric values for performance of work are so noted, except where the context of a requirement implies this qualification.
3. Conflicting Values:
   a. Where seemingly conflicting values are indicated (e.g., where compliance with an imposed standard conflicts with drawing dimensions), refer any perceived conflict to the Project Director/COR for resolution. In general, the most explicitly indicated value will govern. However, the Project Director/COR has the authority to require compliance with the most stringent requirement for adequate fulfillment of the intention of Contract documents.
   b. Where conflicting requirements in the Contract documents imply two qualities or quantities of substantially equal value (e.g., where two different colors are indicated by related documents for same element of work), refer resolution of the selection question to the Project Director/COR.
4. Refer questions of minimums vs. maximums or of conflicting values in the Contract documents to the Project Director/COR.

C. Graphic Symbols:

1. In general, graphic symbols included with the Contract documents, including those shown on Contract drawings, are defined thereon or are recognized in the construction industry for purposes inferred by the context.
2. Where not otherwise defined, consult industry-standard symbolization publications sponsored by trade associations including AIA (e.g., *Architectural Graphic Standards* published by John Wiley & Sons, Inc.), ASHRAE, ASME, ASPE, IEEE, ANSI, Federal Government Agencies and Departments, and other recognized consensus interests of construction industry.

1.06 ON-SITE STAFF REQUIREMENTS

the Contractor shall provide an adequate professional administrative and supervisory staff on-site for all aspects of the work. This key staff shall be fully coordinated and provide a professional level of Project execution management. The following is a list of the on-site staff the Contractor must provide and the corresponding clearance level required for each:

Position Description	Specification Reference	Clearance Level
Project Manager	Section 011005	Not Required
Superintendents (2 persons)	Section 011005	Not Required
QC Manager	Section 014010	Not Required
Project Controls Engineer	Section 013205	Not Required
Safety Health Project Manager	Section 013525	Not Required
Warranty Manager (during warranty period)	Section 017705	Not Required

A. Project Organization Chart:

1. The Contractor shall depict principal staff assignments and contact information on a Project Organization Chart. This chart shall include key administrative and supervisory staff.
2. The Contractor shall provide resumes of key staff.
3. The Contractor shall depict how management, supervisory, and administrative functions shall be performed and, as applicable, indicate where multiple tasks shall be performed by the same individual.

B. Minimum On-Site Staff Qualifications:

C. Project Manager:

D. Minimum 5 years of professional employment as an engineer or architect managing comparable work and a bachelor's degree in architecture or engineering.

E. Experience in all aspects of design/build contract execution.

F. The Project Manager shall be supported by qualified construction management, field engineering, project controls, and administrative support staff as necessary.

G. Superintendents:

H. The Contractor shall provide superintendents and other supplemental staff as described in the Contract documents or as necessary to perform the work within the timelines and quality standards specified.

I. Knowledge, skill, and experience with U.S. construction methods, techniques, and standards.

J. Resume shall indicate area of practice (e.g., civil, structural, mechanical, electrical, materials, finishes, etc.).

K. Minimum 5 years of supervisory field experience in the applicable discipline.

L. Project Control Engineer: See Section 01321, Project Scheduling.

M. Quality Control: See Section 01401, Contractor's Quality Control.

N. Health and Safety Manager: See Section 01521, Construction Safety and Occupational Health.

O. Each entity engaged in the performance of the work, including product manufacturing, handling materials and products, fabricating, installing, working to dimension, finishing, testing, and similar operations, shall be familiar with referenced standards applicable to that entity's operations.

P. Staff shall be qualified for the work performed as documented by certifications, licenses, permits, test reports, judgments, and similar documentation.

Q. Each trades-person shall be skilled, experienced, and properly equipped to produce the required quality of work.

1.07 USE OF PROJECT SITE

A. See appropriate attachment at Contract Section J for Project Site boundaries and any requirements/restrictions pertaining to the utilization of the site.

B. The Contractor shall perform work in accordance with applicable security requirements specified in the Contract Documents.

C. On-site waste disposal, including burial or burning of any materials shall not be permitted. With the concurrence of the Project Director, an exception may be made for burning Project documents on-site.

D. Protection of Existing Plantings: The Contractor shall protect existing trees and other plantings on the Project Site during construction, as noted in the landscaping design. The Contractor shall remove existing vegetation only with prior consent of the Project Director/COR. The Contractor shall not allow construction traffic or storage of materials inside the drip lines of existing trees. The Contractor shall re-establish existing lawns following general completion of construction. Requirements of this paragraph shall be performed in accordance with Site work and landscape requirements.

E. The Contractor shall ensure that surplus, waste, and rejected material is promptly removed from the Project Site, disposed of as specifically identified under the appropriate Contract clauses, and that the Project Site is not used for the sale of such material.

F. The Contractor shall comply with regulations of local governing authorities provided they do not conflict with the requirements herein. The Contractor shall forward questions and issues to the Project Director/COR promptly.

G. Protection of Adjacent Properties: The Contractor shall prevent and repair any damage to surrounding and adjacent properties arising from performance of the work.

H. Occurrence Report: The Contractor shall report, in writing, all unusual events and discoveries at the Project Site including, unexpected weather phenomena, exceptional visitors, unusual encounters during excavation, or similar occurrences.

I. During excavating work, the Contractor shall notify the Project Director/COR promptly upon encountering significant elements of geological, historic, archaeological, or other similar interests. Elements protected by local law do not belong to the Contractor and shall be protected and preserved until disposition instructions are received from the Project Director/COR.

J. The Project Director/COR will notify the Contractor of all planned and scheduled U.S. Government and local government ceremonies at the Project Site. The Contractor shall coordinate and curtail construction activities as requested to avoid interference with such ceremonies or endangering participants.

K. The Government reserves the right to place and install equipment as necessary in completed areas of the building and to occupy such completed areas prior to Substantial Completion. This occupancy is contingent upon no substantial interference with the completion of the work. Such placing of equipment and partial occupancy will not constitute acceptance of the Contractor's work entire or in part.

1.08 SITE UTILIZATION PLAN

A. The Site Utilization Plan shall address the Contractor’s proposed methods of, at a minimum:

1. Coordinating allocation of available work and storage areas equitably among all entities to integrate and maximize the execution of the work.
2. Locating temporary facilities including, paved parking, work areas, sheds, and similar elements. Refer to Section 015005, *Temporary Facilities and Controls*, and Section 013525, *Construction Safety and Occupational Health.*

3. Maximizing temporary facilities effectively and efficiently, conserving energy and water, and integrating drainage capacity.
4. Optimizing adequate access and utilization of temporary facilities for all entities.
5. Protecting existing vegetation.
6. Utilizing just-in-time delivery scheduling to minimize long-term storage.
7. Ensuring that surplus waste and rejected material is promptly removed from the Project Site and disposed of properly.

1.09 PROJECT SITE HOURS OF OPERATIONS

A. Unless otherwise agreed upon in writing, work shall be performed only during the days and hours specified below.

1. Contractor's Workweek:
   a. The Contractor shall plan execution of the work based on a 6-day workweek. The Contractor shall validate the days of the workweek in terms of local, national, and religious customs. The Contractor shall become familiar with local customs and ensure all Project execution actions are in accordance.
   b. Should the Contract documents conflict with local workweek customs, the Contractor shall bring to the attention of the Project Director/COR in writing for resolution.
   c. While work may proceed on the days of the week as specified, the Contractor shall validate local labor laws and customs which may restrict total allowable hours worked within a given week. The Contractor shall adjust crew planning accordingly.
   d. The Project Director/COR will be responsible for all Government staff coverage. The Contractor shall coordinate a workweek execution plan and obtain the Project Director/COR acceptance.
2. Contractor's Working Hours per Day:
   a. Working hours shall be a maximum of 10 hours per day, exclusive of screening time, unless restricted by local custom for one or more given days of the week. In each case, the Contractor shall become familiar with local customs and ensure all Project execution actions are in accordance.
   b. Unless otherwise modified in writing by local permit, the working hours for this Project are as specified above.

B. Contractor's Overtime:

1. The Contractor shall provide written request to the Project Director/COR, at least twenty-four (24) hours in advance, of any proposed overtime work that is outside of the hours specified. The Project Director/COR's written acceptance must be obtained prior to scheduling overtime work outside the specified working hours.

2. Contractor overtime, as used to calculate reimbursement of supervision costs to the Government, is computed as time worked over 10 hours in a regular workday and all time worked outside of the regular 6-day workweek.
3. For each hour of Contractor overtime, the Government will be required to provide appropriate supervision, inspection, security, and administration staff. The Contractor shall reimburse the Government for costs incurred in direct support of such overtime. at the following flat rate, per person, per hour:
4. The Government on-site Project Supervisory staff shall be compensated as follows: Project Director/COR at $80/hr; Construction Manager and US National Engineers at $70/hr; Local National Engineers/Inspectors at actual rates; Secretary at actual rate; and Driver at actual rate. All local actual rates shall be determined by the Project Director/COR.
5. The Government on-site Security Management staff shall be compensated as follows: Site Security Manager at $80/hr; Site Security Coordinator (if used) at $49/hr; Team Leader (if used) at $47/hr; Construction Security Technicians at $43.50/hr; Cleared U.S. citizen Guards at $41.50/hr; and Local Guards at actual rate. All local actual rates shall be determined by the Project Director/COR.
6. In response to the Contractor's written request for acceptance of overtime work, the Project Director/COR will notify the Contractor of the chargeable amount. The Contractor shall certify the chargeable amount and provide a credit for such charges to the Government through a modification to the Contract price.
7. Contractor Charges, Government Support Staff (Coordination Error): The Contractor shall be liable for Government support staff charges when, per Contract conditions, an inspection is requested, Government staff is ready to execute said inspection, Government support staff is not normally available, and the Contractor designates the work as not ready.

C. Designated Holidays:

1. Local Holidays - The Contractor shall observe, validate, and plan the work around local national holidays during the construction period. Should any of the holidays fall on a local non-workday, or local custom weekend day, the Contractor shall exercise due diligence to ensure local customs and appropriate compensation issues are addressed.
2. U.S. Holidays - Refer to Contract Section H.2, *Observance of Legal Holidays and Administrative Leave* (Note: Government Supervision requirements during a holiday listed in H.2 are considered overtime and shall be compensated accordingly).

D. Excepted Operations:

1. The only work permitted outside of work hours or days specified above will be due to special circumstances, such as in completion of on-going concrete operations, continuous placing, casting, and curing. The Contractor shall provide written request to the Project Director/COR at least twenty-four (24) hours in advance of such operations and obtain the written acceptance of the Project Director/COR prior to scheduling any such work. Any additional costs incurred by the Government (including but not limited to, supervision, security, and inspection) resulting from extended Contractor work hours or days shall be reimbursed to Government by the Contractor in accordance with the applicable paragraphs, above.
2. Should the Contractor desire to change Contract work hours or days specified above, a proposal must be submitted to the Project Director/COR fully justifying any such change. Justification shall contain, at a minimum, a detailed discussion of potential impacts to the Project Execution Schedule, the float, and all related cost impacts.
3. The Project Director/COR will review the proposal and forward a recommendation to the Contracting Officer who will make the final determination. If the change is accepted, the Contracting Officer will issue a modification to the Contract. Any additional costs incurred by the Government (including but not limited to, supervision, security, and inspection) resulting from this type of Contract modification shall be reimbursed to the Government by the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall coordinate all phases and aspects of the work to achieve intended results, including the best overall visual effect for all exposed work, regardless of trade or material. The Contractor shall remove and replace workmanship that is found non-compliant at no additional cost to the Government.

B. Except as otherwise indicated, the Contractor shall comply with the following general requirements for the installation and coordination of work:

1. Require each installer to inspect substrates and report unsatisfactory installation conditions. Installation shall not proceed until unsatisfactory conditions have been corrected. Measurements shall be rechecked before proceeding.
2. Inspect delivered materials, fabrications, and equipment prior to installation and reject damaged or defective items.
3. Install each element of the Project only during weather conditions that shall contribute to successful workmanship and allow for proper curing, protection, and concealment.
4. Comply with manufacturer's instructions for each installation.

5. Isolate each element of work from contact with incompatible work.
6. Coordinate concealment, enclosing, or other covering over of work with requirements for inspection or testing to avoid the necessity for uncovering completed work.
7. Where mounting height for any element of the work is not shown, mount at industry-recommended standard height for the application indicated.
8. Secure or anchor each element of the work to its supporting substrate as indicated. If not otherwise indicated, secure or anchor as recommended by the manufacturer or in compliance with the applicable trade association standard.

C. The Contractor shall provide material layout areas to ensure the safety of all staff, employees, and visitors to the Project Site. These areas shall also provide security for the materials contained therein.

D. Product Compatibility:

1. Where product options are open for the Contractor's selection, selection must be compatible with interfacing products.
2. Where products interface, the Contractor shall coordinate selections for compatibility prior to procurement and without regard for the sequence of each product's installation. The Contractor shall advise the Project Director/COR of compatibility issues that cannot be reconciled.
3. Product non-compatibility that results from the Contractor’s incorrect selection is not an allowable basis for Contract modification.
4. Through the Project Director/COR, the Contractor shall coordinate selections with products already selected and procured under separate contracts or by the Government. The Contractor shall request information on such products.

E. At the earliest feasible date, the Contractor shall provide temporary enclosure and lock-up of each separate portion of the new construction. The Contractor shall protect completed work in every reasonable way, ensuring undamaged condition at the time of Substantial Completion or turnover to the Government.

F. The Contractor shall be responsible for all materials delivered and work performed until completion of the work and final acceptance by the Government as defined herein. The exception is any completed unit of work which may have been previously accepted under the Contract.

3.02 COORDINATION MEETINGS

A. Pre-Construction Conference:

1. The Project Director/COR will conduct a pre-construction conference on or near the date of the design issued for construction and thirty

(30) calendar days prior to the Contractor's mobilization to the Project Site.

2. Attendees will include a representative from each Contractor working on the Site during the first three months of scheduled construction work.
3. Agenda items will include a review of the general plans, conditions, procedures, and requirements as necessary for the effective scheduling and prosecution of the construction work. Parties will review security and material delivery requirements, personnel assigned, and Contract communication procedures as established for the Project.
4. Where and when feasible, a meeting will be scheduled and conducted at the Project Site. Otherwise, a meeting will be held at a location selected for the greatest convenience of the majority of attendees.

B. Construction Coordination Meetings. The Contractor and Project Director/COR will hold weekly construction coordination meetings to discuss schedule and status of outstanding issues. Weekly coordination meetings shall commence immediately upon mobilization to the Project Site.

1. Construction coordination meetings are intended to promote a full exchange of information between the USG and the Contractor, promote open and honest discussion between parties, and identify areas of concern by each party. All parties shall seek the expeditious resolution of issues before they become problems.
2. The weekly construction coordination meeting shall have an agenda as follows:

a) Submittal Register
Contractor shall review and brief the current status of design and construction submittals.

b) Project Execution Schedule
Progress of the work shall be reviewed. Contractor shall revise and submit an updated project execution schedule in accordance with Section 013205, Project Scheduling.

c) Visitors
Review list of scheduled visitors for both the Contractor and the Government and the reason for the visit.

d) Quality Control

Review outstanding issues and agreed to dispositions.

e) Safety

Review outstanding issues and agreed to dispositions.

f) Security

Review outstanding issues and agreed to dispositions.

g) Requests For Information (RFI)

Review the project RFI log; identify outstanding RFI's that may impact the schedule and agree to a course of action to expedite resolution.

h) Change Orders

Review the log of outstanding change orders; expedite the completion of change orders.

i) Correspondence

Review correspondence between Project Director/COR and Contractor to ensure all written letters were received and there is no misunderstanding of the content or intent of the correspondence.

j) Material Tracking Schedule and Procurement Log

Review the project procurement log to ensure expeditious processing of shipping documents from point of origin, through shipping services, through the local Ministry of Foreign Affairs or equivalent. Identify shipments that may adversely impact the project execution schedule. Develop, agree upon, and execute remedial courses of action, as necessary.

3. Meeting Minutes. The Contractor shall provide meeting minutes in agenda format to the Project Director/COR the next working day after each construction coordination meeting. The Project Director/COR will sign the meeting minutes upon agreeing to their accuracy. Final meeting minutes signed by the Project Director/COR and the Contractor's Project Manager will be distributed by the Project Director/COR no later than two working days after the coordination meeting and shall become part of the final project record set.
4. Minutes will carry open issues from week to week until resolved and will include origination date, responsibility, resolution date, and resolution action before removing from the minutes.

C. Project Progress Meetings (May be part of Construction Coordination Meetings):

1. Refer to Section 013205 *Project Scheduling*.
2. The Contractor shall conduct weekly meetings to discuss Project progress and monthly meetings to discuss Contractor payment.
3. Required Attendance: The Contractor's Project Manager.
4. The agenda shall address the following topics, at a minimum:
   a. Describe, on an activity-by-activity basis, all proposed revisions and adjustments to the PES required to reflect the current status of the Project. The Project Director/COR will review and accept activity progress, proposed revisions, and adjustments as appropriate.
   b. Provide a complete and accurate report of procurement and construction progress effective at the AS OF date.

D. Safety Meetings: In accordance with Section 013525, *Construction Safety and Occupational Health.*

E. QC Meetings: In accordance with Section 014010, Contractor's Quality Control.

F. Pre-Installation Meetings: As required by Contract Technical Specifications or as requested by the Contractor Refer also to Contractor's QC Plan in Section 014010, *Contractor's Quality Control)*.

3.03 GOVERNMENT-FURNISHED ITEMS

A. As delineated in Contract Section C, the Government may provide equipment or material for either Government installation or Contractor installation, designated as GFGI and GFCI, respectively.

B. In all cases, the Contractor shall coordinate with the Government and plan to accommodate these items during design, receiving, transportation, secure shipment and storage, material handling, and integration of the installation into the general works.

C. The Contractor shall support the infrastructure for Government-furnished items. For example, if the Government will provide and install an alarm system, the Contractor shall provide and install conduits, raceways, cables, terminal boxes, and source power. For security alarm systems, the applicable infrastructure shall be as specified in the Technical Security System (TSS) drawing package. For other systems, the Contractor shall execute due diligence in obtaining information, catalog cuts, etc., from the Government and others to deliver the requisite infrastructure. The Government will make terminations and install and test the end items.

1. The Contractor shall provide and install TSS rough-in and installation materials.
2. The Contractor shall coordinate, integrate with, and assist the Government and Government subcontractors for the effective

installation, termination, overall testing, modification, and adjustment to TSS.Government-Furnished Furniture:

3. The Government will design, specify, procure, and track said material to a Contractor-designated receiving point within the continental United States.
4. The Contractor shall receive and inventory said material and report receipt and any discrepancies in product, quantity, finish, fabric, hardware, etc. and any damages within seven (7) days following delivery.
5. The Contractor is responsible for reporting damaged items after the seven (7) day period and until Substantial Completion. Prior to issuing Substantial Completion, the Project Director/COR will provide the Contractor with a list of damaged or defective furniture and the Contractor shall be responsible for repair or replacement.
6. The Government will provide a Project record book with photographs or illustrations and samples keyed to floor plans and purchase order documents.
7. The Contractor shall store, consolidate, contain, ship, clear, install, inspect, performance test, and revise As-Built and As-Installed drawings. The Contractor shall also list all deficiencies.
8. The Contractor shall support infrastructure and terminate electrical connections as necessary for proper operation.
9. The Contractor shall itemize, consolidate, mark, and report uninstalled inventory and arrange for transfer to Post responsibility.

3.04 FIELD ENGINEERING

A. Working from recorded property markers and benchmarks as available, and as indicated in the Contract documents, the Contractor shall confirm provided property surveys and shall establish permanent points of locations, lines, and levels of the Site. The Contractor shall lay out the Project in its principal lines and levels as needed for accurate placement of work by each Project execution entity.

B. The Contractor shall calculate and measure within recognized tolerances. Drawings shall not be scaled to determine dimensions. As work progresses, the Contractor shall record non-corrected deviations from required lines and levels that are beyond recognized tolerances. The Contractor shall report significant consequences of such deviations to the Project Director/COR promptly.

C. The Contractor shall maintain a surveyor's log (as applicable) of continuing field measurements.

D. The Contractor shall engage licensed or registered land surveyors or professional engineers (as applicable) experienced in forms of field engineering required by the Project.

E. The Contractor shall confirm locations and elevations of existing utilities (as applicable) in and around the Project Site before the commencement of any excavation or foundation work.

F. The Contractor shall confirm pipe sizes and invert elevation calculations for water or waste-bearing lines (as applicable). The Contractor shall record the type of construction, general condition or state of repair, and auxiliary features of such utilities.

G. The Contractor is responsible for the correct location, line, and level of its portion of the work in relation to established lines and levels. Each Project execution entity is responsible for coordinating adjoining and interfacing work, whether previously or subsequently installed.

H. Field Engineering Submittals: The Contractor shall submit the following in accordance with submittal procedures described in detail in Section 013305, *Construction Submittals*:

1. Confirm Property Survey (as applicable)
2. Surveyor's Log (as applicable): The Contractor shall maintain a current log of all survey activity. The log shall become part of the final Project record set.
3. Final Property Survey (as applicable): The Contractor shall record location, line, and level of significant features, including real property, as constructed upon the Project Site. The Contractor shall indicate dimensions of the perimeter fence and gate facilities in relation to property lines. The Contractor shall include the surveyor's certification confirming dimensioned lines and levels are true and accurate as shown on the final survey and that permanent benchmarks and property corner markers are installed, located, and labeled as shown.
4. Photographic /Video Survey: The Contractor shall prepare and submit an initial instrument survey complete with photographic and video capture of all existing Site conditions within 45 days of the Contract award date. These conditions must be complete in scope and include historic and significant properties and adjacent structures (buildings, roads, and utilities). The survey shall include a description, photographs and video of the general condition of the properties and structures as well as any visible cracking, fitting, or settlement. A sketch plan or elevation shall be prepared to clarify the any unusual conditions.

3.05 PROTECTION

A. The Contractor shall protect and maintain all facilities, materials, and equipment during receipt, handling, storage, installation, curing, and similar stages of construction execution. This shall ensure minimum exposure to hazards and deterioration to the work.

B. The Contractor shall comply with applicable manufacturer's instructions and requirements of the individual work sections of the Contract Technical Specifications.

C. The Contractor shall apply protective coverings where necessary to ensure completed work by any entity shall remain undamaged. Protective coverings shall be maintained until Substantial Completion.

D. Stairways: When the temporary use of permanent stairways is authorized by the Project Director/COR, the Contractor shall cover and protect finishes on each tread, riser, and nosing with padding and plywood or a similar system.

E. The Contractor shall ensure that all components placed into operation are protected from damage and deleterious effects.

F. The Contractor shall limit exposure of work to risks of harm and damage due to excessive loading and pressures, extreme temperatures, humidity, water, ice, solvents, chemicals, puncture, abrasion, heavy traffic, soiling and staining, corrosion, infestation, combustion, contact with incompatible materials, misalignment, and other threats. Refer to Section 013525, *Construction Safety and Occupational Health*, for additional requirements.

G. Once installed, the Contractor shall protect interior fixtures and furnishings from dust, debris, traffic, or other deleterious side effects of the construction process.

3.06 CUTTING AND PATCHING

A. The Contractor shall perform cutting and patching operations where indicated on the Construction Drawings. These activities shall be included in the automated Project execution control system.

B. Examination: The Contractor shall evaluate all possible physical reactions from the planned cutting and patching operations. The Contractor shall focus on threatened losses, inherent dangers, and possible obvious or hidden exposures to mechanical, electrical, or other utilities.

C. Preparation: Before proceeding with any cutting and patching operations, the Contractor shall initiate all necessary protective provisions. These provisions shall include temporary supports, alternative services, temporary protective coverings or enclosures of adjoining work, protection of adjacent surfaces, dust control (palliation), spatter control, and warning signs. The Contractor shall plan for and enforce provisions limiting cutting only to intended elements and avoiding the unintentional and unauthorized cutting or damaging of unintended elements.

D. Continuity of Service: The Contractor shall maintain utility service and security systems during all cutting and patching operations. Where required

cutting shall necessitate the shutdown or the discontinued use of utility lines or distribution services, the Contractor shall provide the Project Director/COR with the scheduled time period for such disruption of service and indicate how temporary services shall be provided to sustain necessary operations. In all cases, the Contractor shall provide emergency, automatically-switched, stand-by power at the highest performance level to selected areas to avoid compromising security systems.

E. General Cutting Procedures:

1. The Contractor shall execute cutting and patching operations utilizing methods and tools that are least likely to damage facilities and unintended elements. The Contractor shall consider using small-scale, low-powered, hand-operated, low-impact, "cutting" type tools.
2. The Contractor shall produce neat, uniform, and accurate cutouts in compliance with the Construction Drawings. The Contractor shall provide protection and execute the cutting work to avoid marring adjacent and adjoining surfaces.
3. The Contractor shall clean each cutout of loosened materials, dust, and debris.
4. Where necessary, the Contractor shall cover all cutout areas prior to patching avoiding exposure to weather and other contaminants.

F. General Patching Procedures:

1. The Contractor shall install suitable anchors or bond coat to permanently secure all patches.
2. The Contractor shall patch with joint bonds or seams at retained material, durable, tight, and as nearly invisible as possible.
3. The Contractor shall install and work all surfaces of exposed patches to a precise level and in alignment with matching finishes, color, pattern, texture, and durability with surfaces.

END OF SECTION

SECTION 013205
PROJECT SCHEDULING

PART 1 GENERAL

1.01 SUMMARY

A. This Section addresses the management process of executing, controlling, and reporting project work.

B. The Contractor's Project Execution Schedule (PES) is the working schedule and the key legal document representing the plan for executing all work under the Contract.

C. The term PES, as used in this Section, refers to any and all stages of the schedule. The specific terms of IPES and BPES are used to identify a particular stage in the development of the PES.

D. The means and methods implied in the PES for accomplishing the contract work are the sole responsibility of the Contractor.

E. The provisions in this Section cover all schedule documents and scheduling practices under the Contract whether they are referred herein or not.

1.02 RELATED DOCUMENTS

A. Other general conditions of the Contract, including Federal Acquisitions Regulations (FAR) clauses by reference or as amended in Contract sections B through J, and other Division 1 sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings, all other Division 1 Specifications, and to Contract Technical Specifications.

B. Contract Sections C, E, and F for information related to design deliverables including the Design Development and Construction Document submittals.

C. Contract Section F for information related to deliverables to be included as tasks and milestones in the PES.

D. Contract section G for additional information related to cost-loading.

E. Section 011005, *Construction Execution and Coordination*, for information on format and content of the submittal register, project procurement log, and materials tracking schedule.

F. Section 013305, *Construction Submittals*, for procedures for submitting PES versions and other deliverables described in this Section.

G. Section 015005, *Temporary Facilities and Controls* for information related to the design, construction, and removal of temporary facilities.

H. Section 017705, *Closeout Procedures*, for information related to closeout activities.

I. Section 019115, *Commissioning*, for information related to development of a commissioning plan and schedule to be incorporated into the PES.

1.03 DEFINITIONS and ACRONYMS

A. U.S. Department of State:

1. USG - United States Government
2. FAR - Federal Acquisitions Regulations
3. DOS - Department of State
4. OBO - Overseas Building Operations
5. CO - Contracting Officer
6. COR - Contracting Officer Representative
7. PD – Project Director
8. PD/COR - Project Director and Contracting Officer Representative.
9. CE – Construction Executive
10. CM - Construction Manager
11. GC - General Contractor
12. PCE - Project Controls Engineer
13. PM - Project Manager
14. GFE – Government Furnished Equipment
15. GFCI – Government Furnished and Contractor Installed
16. GFGI – Government Furnished and Government Installed
17. CRP – Consolidated Receiving Point
18. G&A – General and Administrative
19. VAT – Value Added Tax REA – Request for Equitable Adjustment
20. NTP – Notice to Proceed
21. LNTP – Limited Notice to Proceed
22. FNTP – Final Notice to Proceed
23. Cx – Commissioning
24. RFP – Request for Proposal
25. ProjNet – Electronic means for document distribution

B. Schedule Terms and Acronyms:

1. PES - Project Execution Schedule
2. IPES - Initial Project Execution Schedule
3. BPES - Baseline Project Execution Schedule
4. PES Updates – IPES or BPES up to date
5. As-Built PES – Final PES Update
6. Current PES Update – Last accepted PES Update
7. CPM - Critical Path Method
8. WBS – Work Breakdown Structure
9. Task - An activity with duration
10. Milestone – A zero-days duration event in the PES
11. Fragnet – Part of the PES represented by a series of activities
12. Original Data – Initial planned data
13. Actual Data – Past record data

14. Resources – Labor, material, and equipment required to complete a project
15. Equipment - A resource used by the Contractor to construct the project
16. Materials (Supplies) - Resources purchased to be built into the Project, including electrical and mechanical equipment
17. Labor – Human resources
18. Open End – an activity having no logic predecessor or successor
19. Loose End – an activity having no logic links to either its start end or its finish end
20. FS – Finish-to-Start activity link
21. SS – Start-to-Start activity link
22. FF – Finish-to-Finish activity link
23. SF – Start-to-Finish activity link

1.04 PURPOSES of the PES

A. To provide a complete information and reference plan of execution of the Project.

B. To be the only plan of execution that is developed and updated throughout the project period of performance.

C. To assure coordination of the Contract Work between OBO representatives, contractor's staff and personnel, subcontractors, material suppliers, and all other parties associated with the project work.

D. To provide short-term look-ahead plans of execution for control management.

E. To record and report actual performance progress.

F. To forecast final project completion and completion of future work based on actual performance to date.

G. To evaluate any time impact associated with unforeseen conditions, unexpected events, contract modifications, performance delays, etc.

H. To be an impartial tool to evaluate REAs.

I. To be the basis for evaluation of the work completed and the preparation of progress payments.

J. To become part of the As-Built Documents of the Contract.

1.05 SUBMITTALS

A. Shall be submitted and reviewed in accordance with the requirements of Section 013305, *Construction Submittals*.

B. Shall be certified by the Contractor's Project Manager (PM) and Project Controls Engineer (PCE) in accordance with certification procedures described in Section 013305, *Construction Submittals*.

C. Submit the following as prescribed above:

1. **Initial Project Execution Schedule (IPES)**
   a. To PD/COR within 30 days following the Contract Award.
   b. Submittal is a prerequisite to the CO issuing any LNTP or NTP.
   c. Acceptance must occur before submission of the Contractor's first Application for Progress Payment.

2. **Baseline Project Execution Schedule Update (BPES)**
   a. To PD/COR before CO issues any LNTP or NTP for construction
   b. Acceptance of the BPES is a prerequisite to the CO issuing the FNTP for construction.

3. **Project Execution Schedule (PES) Updates**
   a. Submit to the PD/COR monthly following acceptance of the IPES and BPES
   b. The Data Date of the PES Updates shall be consistent with the Closing Date of the Applications for Progress Payment
   c. Acceptance of the PES Update is a prerequisite to approving the corresponding Contractor's Application for Progress Payment.
   d. The Final PES Update shall become the As-built PES.
   e. Acceptance of the As-built PES is a prerequisite to:
      1) Release of Final Payment
      2) Final Acceptance Certification

D. Every PES submittal shall include the following:

1. Printed copies (as directed by PD/COR) of:
   a. Narrative Report
   b. Updated Procurement Log
   c. Bar charts of the following schedule fragnets
      1) Critical Path Progress Report
      2) Next Period Look-Ahead
      3) Labor resource histogram and cumulative curve
      4) Cost histogram and cumulative curve

2. Two (2) Compact Discs (CD) containing:
   a. An executable backup file of the current PES with a proper and unique file name different from any previously submitted
   b. Copies of the printed reports submitted in Portable Document Format (.pdf), each scaled to the same size as the printed report
   c. Each CD shall have a printed label that includes:
      1) Project name
      2) Post name
      3) Schedule file name
      4) Contractor name
      5) Data Date
      6) Security classification, if required

3. Upload to ProjNet
   1. All documents required above shall be uploaded to ProjNet.

2. ProjNet submittal is not an alternative but one of the three forms of submittal.

1.06 GOVERNMENT REVIEW PROCESS

A. After the PD/COR receives the schedule update data, pay application, and all required submittal documents described above, the USG shall review the schedule and supporting documentation for continued contract compliance and integrity. A written reply will be issued within 15 calendar days after receipt of all required information.

B. The PD/COR and OBO staff will review the updated PES to verify the accuracy of the on-site work progress – activities started, completed, and on-going and their respective completion percentages.

C. Under no circumstances does USG “acceptance” of an IPES, BPES, or PES Update, modify or imply a modification to the terms of the Contract.

D. The PD/COR may request additional information as a result of the review process, and the Contractor shall comply with such request.

E. The PD/COR may request the Contractor to participate in any meeting necessary to reach a mutual agreement on any PES, PES report, PES update, and revisions of these items.

F. If any of the required contractor submissions are returned for correction, addition, or revision; then they shall be resubmitted, as prescribed above, within 15 calendar days after the request for resubmission.

G. PES review comments and acceptance or rejection by the USG of any PES version does not relieve the Contractor of his responsibility for the accuracy and feasibility of the PES or of his obligation to achieve the dates of Substantial Completion and Final Project Completion of the Work. USG acceptance does not expressly or impliedly warrant, acknowledge, or admit the reasonableness of the activities, logic, durations, etc., of the PES.

1.07 PROJECT CONTROLS ENGINEER (PCE)

A. The PCE shall be assigned by the Contractor to the Project from the first LNTP for construction to Final Acceptance.

B. During construction, the PCE shall be resident at the Project Site from mobilization to Substantial Completion.

C. The PCE shall:

1. Be responsible for the preparation of the required schedules and related documents in compliance with the provisions of this Section.
2. Be responsible for Project coordination procedures of this Section throughout the construction period of the Contract.

3. Be considered part of the Contractor's key management personnel.
4. Provide prompt response to PD/COR inquires about the status of the Project, or any subject related to the progress of the Project.
5. Work in close cooperation with the Contractor's PM, superintendent, subcontractors, suppliers, and OBO's management and scheduling support staff relative to the development and implementation of the PES.
6. Have experience as a construction Project Scheduler on at least two previous projects of comparable scope of work and of a value no less than half of this Project.
7. Final approval of the PCE, based on his, or her, curriculum vitae, is required by the USG.

D. The Government will be permitted to review the Contractor's work progress at any time through direct contact with the PCE and have full access to the PES.

E. The PCE shall not be replaced without the approval of the PD/COR.

F. If the Government informs the Contractor in writing that the PCE is not performing the required duties to the satisfaction of the Government, the Contractor shall replace the PCE at no additional cost to the Government. The Contractor shall submit in writing, within 30 calendar days, the qualifications of a new PCE for approval of the PD/COR.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SCHEDULING SOFTWARE

A. OBO supports:
1. Oracle Primavera, P6, Release 7.0
2. Primavera Project Planner, P3, Version 3.1

B. All scheduling provisions in this section are based on the methods and terminology used by Primavera scheduling software programs specified above.

3.02 SCHEDULE DEVELOPMENT

A. The detailed PES will include tasks and milestones representing the entire Contract Scope of Work including:
3. General requirements (see Contract Section F)
4. Complete Design
5. Submittals
6. Procurement of long lead and important items (see Contract Section H)
7. Shipping of long lead and important items (see Contract Section D)
8. Mobilization (see Division 1, 011005)
9. Construction (see Division 1, 011005)
10. Commissioning (see Division 1, Section 019115)

11. Closeout and Demobilization (see Division 1, 017705)

B. Baseline schedule development:

1. Whether the IPES or the BPES, the baseline schedule shall be developed in accordance with all provisions herein included unless it is specifically indicated.
2. The baseline shall be fully Cost-loaded to the full Contract Amount less any included VAT. Details of the Cost-load provisions are included below in this Section.
3. The baseline shall be resource-loaded. Details of the Resource-load provisions are included below in this Section.
4. The baseline shall use days as the unit basis for development.
5. The original duration of the construction activities shall not exceed 14 calendar days. For the IPES this level of detail applies only to activities with Early Dates before the first 60 days after FNTP.
6. The Total Float of all activities shall not exceed 120 days. For the IPES this level of detail applies with Early Dates before the first 60 days after FNTP.
7. The baseline schedule shall include three calendars applicable to each activity as it is indicated below in this Section.
8. The baseline shall include at a minimum the milestones listed below in this Section.
9. The baseline shall include considerations for local weather and climate seasons.
10. Constraints shall be avoided; otherwise; the presence of constraints in the schedule shall be indicated and justified in the Narrative report.
11. Lags and Leads are prohibited.
12. Open-Ends and Loose-Ends are not permitted.
13. SS, FF and SF links shall be avoided. If used, the Contractor shall indicated it in the Narrative report and confirm that the schedule is free of Circular Loops, Open-Ends, and Loose-Ends.
14. Retained Logic shall be logic applicable to the baseline schedule.
15. Activity Codes shall be assigned to all activities. Details of the minimum Activity Codes required are indicated below in this Section.
16. The baseline schedule is the reference plan of execution and shall remain invariable throughout the duration of the project unless changes to the plan arise. Provisions to change the baseline schedule are included below in this Section.

C. **PES Updates**:

1. The updating process of the IPES and BPES is limited to the input of Actual Data; any other addition or deletion shall be treated as a change to the baseline. Provisions to change the baseline schedule are included below in this Section.
2. Actual Data is considered only Actual Dates, Actual Durations, Actual Resources, Actual Costs, and Actual Percentages of Completion.
3. For Control purposes. Activity percentage of completion shall be identical to Cost percentage of completion.

D. **Narrative Report**:

1. All PES submissions shall include a Narrative Report
2. It is the responsibility of the Contractor to include all remarks, explanations, identifications, justifications, etc. required for the complete and proper interpretation of the schedule.

E. **Milestones**:
The PES shall include at a minimum the following milestones as applicable:
1. Contract Award
2. LNTP for Design
3. NTP for Design
4. LNTP for Construction
5. FNTP
6. GFCI Furniture Drawings Submission
7. Approve GFCI Furniture Drawings
8. Secure Logistics & Installation Plan Submission
9. GFCI Furniture Delivery to CRP Started
10. GFCI Furniture Delivery to CRP Completed
11. GC Submits Final GFCI Furniture Receiving Report
12. Training Plan Submission
13. Commissioning Plan Submission
14. Commissioning Milestones
15. O&M Manual Submission
16. Systems Manual Submission
17. Accreditation Check List Completion
18. Substantial Completion for each building and major area of construction
19. Project Substantial Completion
20. Final Commissioning Report Submission
21. Final Acceptance
22. Owner Move-in
23. Start Phase X
24. Finish Phase X

F. **Cost Loading**:
1. Every activity that implies cost shall be cost-loaded
2. The Total Budgeted or Planned Cost of the PES shall coincide with the Total Contract Amount less any included VATs.
3. G&A Costs shall be distributed proportionally to all cost-loaded activities.
4. The following activities shall NOT be cost loaded:
   a. Procurement activities
   b. Manufacturing activities
   c. Shipping activities
5. The following type of activities shall NOT be cost loaded:
   a. Summary activities
   b. Hammocks activities
   c. Level of Effort activities
   d. Milestones
   e. Flags

G. **Resource Loading**:
1. All construction activities shall be resource-loaded
2. All resources shall be defined and quantified in every activity
3. Labor resource shall be defined by trade and quantified by labor-day units
4. Equipment resource shall be defined by type and quantify by day units

5. Materials resource shall be defined and quantified as applicable according to the nature of the activity.

H. **Cost Histogram and Cumulative Curve**:
1. Every baseline schedule submittal shall include:
   a. The complete monthly basis Histogram of the projected Late Dates Costs
   b. The complete Cumulative Cost Curve of the projected Late Dates Costs
2. Every schedule update submittal shall include:
   a. The complete monthly basis Histogram of the Actual Dates Costs and projected Early Dates Costs
   b. The complete Cumulative Cost Curve of the Actual Dates Costs and projected Early Dates Costs

I. **Labor Histogram and Cumulative Curve**:
1. Every baseline schedule submittal shall include:
   a. The complete monthly basis Histogram of the projected Late Dates Total Labor input
   b. The complete Cumulative Curve of the projected Late Dates Total Labor input
2. Every schedule update submittal shall include:
   a. The complete monthly basis Histogram of the Actual Dates Total Labor input and projected Early Dates Total Labor input
   b. The complete Cumulative Cost Curve of the Actual Dates Total Labor input and projected Early Dates Total Labor input

J. **Calendars**:
1. All activities performed in United States shall be based on a 5-day calendar that includes all Federal US Holidays.
2. All procurement and shipping activities shall be based on a continuous 7-day calendar with no holidays.
3. All constriction activities shall be based on a 6-day calendar that includes US and local holidays.
4. Any additional calendar used shall be identified in the Narrative report.

K. **Activity Codes**:
All activities shall include the following codes:
1. Type of Work: Design, Submittals, Procurement, Construction
2. CSI Division
3. Work Area: Subdivided as needed for easy identification
4. Responsibility
5. Contract Modification: As applicable
6. Phase: As applicable

3.03 REVISING THE BASELINE

B. Acceptance of any revision to the current BPES is prerequisite to any logic changes to the PES update.

C. The BPES is the Plan of Execution and shall be kept unaltered at all times under normal conditions. In the event that changes are required due to change of

conditions such as contract modifications, or other unforeseen situations, the Contractor shall request revising the Baseline.

1. The Contractor shall propose the revision to the PD/COR for review and acceptance.
2. This proposal shall include a narrative of reasons and a list of all the changes with descriptions and justifications.
3. The Revised BPES shall be developed and proposed on the Current PES Update keeping the same Data Date.
4. Once the changes are accepted by the PD/COR, the Revised BPES will be applicable to the subsequent PES Updates.

3.04 PLAN OF RECOVERY OR PLAN OF MITIGATION

A. The PD/COR can request the Contractor to submit a Plan of Recovery or a Plan of Mitigation due to any special situation.

B. The Plan of Recovery or the Plan of Mitigation shall consist of a detailed description of actions to be taken to achieve the targets of the PES. These actions do not necessarily imply any alteration of the PES. The Contractor then shall submit a narrative description of the Plan.

C. In the event that the Revision of the Baseline is required, the Contractor shall proceed in accordance with the provisions for Revising the Baseline. Upon acceptance of the PD/COR, the Revise Baseline then shall implemented and can be named the Recovery schedule or the Mitigation schedule.

3.05 TIME IMPACT ANALYSIS (TIA)

A. The purpose of the TIA is to identify and evaluate the impact of a particular event or situation on the completion of the Project.

B. **Past Events**:
If the event or situation subject to analysis occurred in the past, the TIA will require the following:
1. A fragnet from the PES Update before the subject event or situation, identifying and filtering the activities related to it, and the Substantial Completion milestone
2. A fragnet with the same activities and Substantial Completion milestone from the PES Update following the occurrence of the event ,or situation
3. A narrative description comparing the two fragnets to demonstrate that the slippage of Substantial Completion was only due to the event or situation subject of the analysis.
4. Similar fragnets of other PES versions and copies of any related documents such as daily reports, meeting minutes, correspondence, etc. to support of the analysis.

C. **Projected Events**:
If the event or situation subject to analysis has not occurred but can be projected in the PES, then the TIA will require the following:

1. A fragnet from the Current PES Update identifying and filtering the activities related to the event or situation, and Substantial Completion milestone.
2. A Revision of the Baseline in accordance with the provisions above to include the anticipated conditions of the subject event or situation.
3. A narrative description comparing the two schedules to demonstrate that the slippage of Substantial Completion will occur due only to the event or situation subject of the analysis.
4. Similar fragnets of other PES versions and copies of any related documents such as daily reports, meeting minutes, correspondence, etc. to support of the analysis.

3.06 PES IMPLEMENTATION

A. The Current PES Update and the BPES shall be available at the construction site at all times.

B. The Contractor shall conduct weekly meetings with OBO management staff at the construction site to review the PES in relation to the progress of the Project.

END OF SECTION

SECTION 013305
CONSTRUCTION SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

A. This Section describes procedures required for the submittal of construction deliverables and provides general submittal descriptions and processing standards.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

1.03 SUBMITTALS

A. Submit the following:

1. Submittal Register

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall transmit all construction submittals to the Project Director/COR for appropriate action using the Submittal Register module in ProjNet.

B. The Contractor shall review all Contract documents and Project requirements and generate a complete list of deliverables for submittal. The Contractor shall ensure all deliverables are considered in the Project Execution Plan and are entered, coded, and tracked in the automated Project Execution Control System.

C. Submittal Register (Refer to Contract Clauses in F and H: The Contractor shall develop a submittal register encompassing Division 1 and Contract Technical Specifications and submit it no later than 30 days prior to start of construction activities. The register shall be part of the Procurement Log (Specification Section 013205) and integrated with the Project Execution Schedule (PES). The submittal register shall include, at a minimum, the information shown in the sample register at the end of this Specification.

D. The Contractor shall plan and coordinate all submittal acceptance processes from the initial transmittal through installation and acceptance of the work. The Contractor shall seek to normalize all submittals and eliminate duplicative actions.

3.02 SUBMITTALS

A. Submittals are written and graphic information and physical samples that require COR's responsive action.

B. Product Data:

1. Refer to Contract Technical Specifications for information regarding technical requirements for product data.
2. Technical Security Systems (TSS) Components(if applicable) Specification Section 280560 Attachment B identifies the various components of the TSS system. Review and acceptance by the Project Director/COR is required prior to purchase and secure shipment of these components.
3. The Contractor shall collect and submit product data for manufactured material required in each unit of work, usually as defined by related technical sections of the Contract Specifications. Where selection of related products is reflected directly in the preparation of shop drawings, the Contractor shall submit product data sufficiently in advance of the submittal for acceptance and prior to the drawings' completion.
4. Choices: The Contractor shall mark manufacturer's standard product data sheets to clearly delineate which choices have been made. The Contractor shall identify choices for Government selection. These choices are usually restricted to color, pattern, texture, and similar attributes. The Contractor shall delete or strike out information not applicable to the choice selection process.
5. The Contractor shall include manufacturer's installation instructions, recommendations for handling, maintenance, protection, testing, start-up, and other procedures as may be applicable.
6. Where product data must be custom-produced (not available as manufacturer's standard printed information), the Contractor shall submit as shop drawings in accordance with applicable requirements.
7. Copies:
   a. Furnish 1 hard copy.
   b. The permanent record of the Government's reply to the Contractor will be in ProjNet Submittal Register.
   c. The Contractor shall print and retain extra copies of product data as may be required for submission as a closeout submittal.
   d. The Contractor shall furnish copies of product data submittals, as accepted by the Government, to each entity involved in the execution of the specific work detailed therein. The Contractor shall indicate intended final distribution on the submittal transmittal form.

C. Shop Drawings:

1. The Contractor shall prepare newly-developed shop drawings (not marked-up drawings) to show how the combination of products and fabricated materials shall be installed. These drawings shall form specified units of work and interface with other units of work or existing work, including "systems" of the building construction.
2. The Contractor shall include drawings for fabrication, installation, setting, patterning, templates, and similar purposes. The Contractor shall outline appropriate materials and product use schedules in each set. The Contractor shall identify each component and show the full set of relevant dimensions, with specific notation reflecting field measurement dimensions. The Contractor shall include performance and test ratings as may be applicable to assemblies shown by the shop drawings.
3. Shop drawings must include a level of detail to completely describe the work product proposed.
4. Media, Copies:
   a. Sheet sizes shall be A2 except where larger dimensions are necessary for legibility, actual-size patterns, templates, similar required drawings, and as may be agreed upon with the Project Director/COR for other unique shop drawing requirements. Shop drawings shall be uniformly sized unless agreed upon otherwise by the Project Director/COR.
   b. The Contractor shall furnish three (3) hardline prints and one (1) electronic in .dwg and .pdf format of each shop drawing.
   c. The Contractor shall print and retain extra copies of the final shop drawings for mark-up during project execution, to reflect accepted as-built conditions, and for submission as a closeout submittal.

D. Field Samples:

1. Where required by Contract Technical Specifications, the Contractor shall provide samples of actual materials, equipment, and assemblies at full-scale size, fully fabricated, and in compliance with physical requirements as shown and specified.
2. The Contractor shall provide a written description with the transmittal form, listing departures and deviations from requirements that were necessary during sample preparation. In any case, the Contractor shall record generic names, sources, manufacturer, compliance with applicable standards, and similar data applicable to each element of sample submitted.
3. Quality Control: Where samples are required for the purpose of achieving quality control, the Contractor shall prepare samples appropriately for inspection and testing by recognized methods as indicated.

3.03 INFORMATIONAL SUBMITTALS

A. Informational submittals are written and graphic information and physical samples that do not require COR's responsive action. Submittals may be rejected for not complying with requirements.

B. Media/Copies: Unless otherwise specified in these Division 1 Sections or Contract Section F, the Contractor shall provide 3 copies of informational submittals to the Project Director/COR. Selected informational submittals may be submitted electronically as provided in Contract Section F.

C. Categories of required informational submittals include, but are not limited to:

1. Submittals related to temporary facility layout and construction.
2. General and special reports, including minutes of meetings, safety and accident reports, shipping logs, security regulation compliance reports, etc.
3. Progress reports, including regular submission of the RFI log, submittal register, manpower requirements, project progress documentation, etc.
4. Inspection and test schedules and reports, including quality control documentation, related certifications of compliance, field samples and mockups, surveys and measurements, and other field engineering submissions.

3.04 CLOSEOUT SUBMITTALS

A. Refer to Section 017705, *Closeout Procedures* for Record Document submittals and Section 017825, *Operation and Maintenance Data* for O&M-related submittals.

3.05 SUBMITTAL TYPE CODING AND DESCRIPTIONS

A. The following are suggested coding schema for the respective submittal types. Each presents a three-place code, first and second places are alphabetic, describing the general submittal type, and the third (and subsequent) place is numeric, describing a specific submittal type. The Contractor shall coordinate the final coding system with the Project Director/COR.

B. Product Data (PDx):

1. PD1, Manufacturer's Catalog Data: Data composed of catalog cuts, brochures, circulars, specifications, and product data. Data shall include preprinted information in sufficient detail and scope to verify compliance with the requirements of the Contract Documents. The Contractor shall clearly mark manufacturer's standard and optional components for each product selected to meet the Contract requirements.

2. PD2, Manufacturer's Standard Color Charts: Preprinted illustrations displaying choices of color, texture, and finish for the material or product.
3. PD3, Instructions: Preprinted material describing installation of a product, system, or material, including special notices and Material Safety Data Sheets concerning impedance, hazards, and safety precautions, if applicable.
4. PD4, Standard Test Reports: A report signed by an authorized official of a testing laboratory stating that a material, product, or system identical to the subject material, product, or system has been tested in accordance with the requirements specified. The test report shall identify the test method and material, state that the test was performed in accordance with the test requirements, state the test results, and indicate whether the material, product, or system has passed or failed the test. Testing must occur within three years of the date of the award of the Contract.
5. PD5, Manufacturer's Certified Drawings: Dimensioned drawings of the product, including components and schedule of performance data. The drawings shall include the manufacturer's certification that the product shown complies with the requirements of the Contract documents. The certified drawings shall be dated after the award of the Contract. The drawings shall include the Project name, Contract number(s), supplier's name and address, certifier's name, and a list of specific requirements the product is intends to address.
6. PD6, Other Product Data: Other product data not included in the above categories.

C. Shop Drawings (SDx):

1. SD1, Data: Submittals which provide calculations, descriptions, or other documentation regarding the work.
2. SD2, Drawings: Submittals which graphically depict the relationship of the various components of the work, schematic diagrams of systems, detail of fabrications, layout of particular elements, connections, and other relational aspects of the work.
3. SD3, Schedules: A tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.
4. SD4, Statements: A document, required of the Contractor, or through the Contractor by way of the supplier, installer, manufacturer, or other lower tier Contractor. The purpose of this document is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality.
5. SD5, Certificates: Statements signed by responsible officials of the manufacturer of a product, system, or material attesting that the product, system, or material meets specified requirements. The statements shall be dated after the award of the Contract, name the

Project, and list specific requirements the product, system, or material intends to address.

6. SD6, Coordination Drawings: Submittals which graphically depict the coordinated location of items specified in more than one Specification Section.
7. SD7, Other Shop Drawings: Other shop drawing submittals not included in the above categories and specified in the Contract Technical Specifications.

D. Field Samples (SAx):

1. SA1, Samples: Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.
2. SA2, Color Selection Samples: Samples of available choice of colors, textures, and finishes of the product or material, presented over substrate identical in texture to that proposed for the work.
3. SA3, Sample Panels: An assembly constructed at the Project Site in a location acceptable to the Project Director/COR and using materials and methods to be employed in the work.
4. SA4, Sample Installations: A portion of assembly or material constructed and placed in a directed location and, if accepted by the Project Director/COR, retained as part of the work.
5. SA5, Mockups: A special form of sample submittal for Government examination prepared near the point of actual installation. Mockups may be at the Contractor's risk and, with concurrence of the Project Director/COR, constructed as the first segment of the actual work. Refer to Contract Drawings and related shop drawings for size and location information of mockups. Uncertainties shall be brought to the Project Director/COR for resolution.
6. SA6, Other Field Samples: Other samples not included in the above categories.

E. Administrative/Informational/Other (ADx):

1. AD1, Inspection Reports: Each report shall be properly identified.
2. AD2, Factory Test Reports: A written report reflecting the findings of required tests performed by the Contractor on the actual work or a prototype prepared for this Project before it shipped to the Project Site. The report shall be signed by an authorized official of the testing laboratory and shall state that the test was performed in accordance with test requirements. The report shall outline the test results and indicate whether the material, product, or system passed or failed.
3. AD3, Field Test Reports: A written report which includes findings of tests performed at the Project Site, on a sample taken from the Project Site, or on a portion of the work during or after installation. The report shall be signed by an authorized official of the testing laboratory or agency and shall state that test was performed in accordance with test

requirements. The report shall outline the test results and indicate whether the material, product, or system passed or failed.

4. AD4, Other Administrative Submittals: Other administrative submittals not included in the above categories.

F. Closeout (COx):

1. CO1, Record Document Submittals: Specific requirements for recording as-built drawings and project coordination drawings are identified in Section 017705, *Closeout Procedures*.
2. CO2, Operation and Maintenance Manuals: Data intended for incorporation into an Operations and Maintenance Manual (Refer to Section 017825, *Operation and Maintenance Data*).
3. CO3, Warranties: Specific warranties required for portions of the work (Refer to Section 017825, *Operation and Maintenance Data)*.
4. CO4, Spare Parts: Spare parts and extra stock (Refer to Section 017825, *Operation and Maintenance Data)*.
5. CO5, Other Closeout Submittals: Other submittals as identified in Section 017705, *Closeout Procedures*, not included in the above categories.

3.06 SUBMITTAL PROCESSING

A. Contractor Certification: All submittals related to the Contract Technical Specifications will be signed by the Architect or Engineer of Record certifying the items submitted have been reviewed in detail, are complete and correct, and are in full compliance and strict conformance with the Contract documents, drawings, specifications, references, etc. Absence of said certification will render the submittal defective and deficient, resulting in an automatic Government disposition of “Rejected; Resubmit (RR).”

B. Submittal Identification:

1. The Contractor shall provide a label, title block, and transmittal sheet on each submittal, attached securely and identifying the following:
   a. Project name and number, date of related Contract documents, and date of submittal.
   b. Name, address, and telephone number of the Contractor’s point of contact responsible for the preparation of the submittal.
   c. Name, address, and telephone number of the following, as applicable: Contractor, Subcontractor, supplier, manufacturer, or fabricator.
   d. Reference numbers and titles of Specification Sections and Contract Drawings, including related details, submittals, and similar cross-references.

2. Transmittal Sheets:
   a. The signed transmittal document serves as a record of the transmittal action.

b. The Contractor shall maintain records of transmitted submittals by date, following the required procedures for the Submittal Register.
c. The Contractor shall include a section for the printed name, signature, and date of the Project Director/COR as the recipient of the transmittal.
d. The Contractor shall provide an appropriate section for each entity involved to record, by signature and date, the receipt, review, and respective action, acceptance, and limitations, if any.
e. The Contractor shall provide a section for the record of certification.

3. Sample Transmittal Form. A sample Transmittal Form is provided as an attachment to this Section.

C. Substitutions for Materials or Products:

1. Proposals for substitutions of materials or products required by the Contract specifications and drawings shall include a specific description of each substitution in writing and provide justification. No proposals for substitutions of materials or products will be accepted after 90 days from the initial NTP. The transmittal shall clearly identify the documents proposing substitutions and shall include the Substitution Request Form (attached) as required by Contract Section H. In addition, the ProjNet Submittal Register field entitled “Contains Variations” must indicate YES. The Contractor shall identify all potential scope, cost, time, and quality changes at the time of the submittal.
   a. Contractor Certification: Each submittal for proposed substitutions shall be certified as described herein.
   b. Government submittal acceptance is a prerequisite of the initiation of the respective work element(s). Any work executed absent Government acceptance of the proposed substitution shall be at the Contractor's risk.
   c. Should the submittal result in the acceptance of the proposed substitution and affect the Contract scope, cost, time, or quality, the Project Director/COR will request that the Contracting Officer negotiate and issue an appropriate Contract Modification. If acceptance does not affect the Contract scope, cost, time, or quality, the Project Director/COR may accept the substitution in writing.
   d. The Contractor shall not presume that acceptance by the Government of a specific request for substitution is a general acceptance of similar variations from the specifications and drawings. By the action of Modification, the substitution is accepted as a performance standard.
   e. Nothing stated herein shall relieve the Contractor of the responsibility of notifying the Project Director/COR of any part of the Contract documents (clauses, drawings or specifications) known, or reasonably anticipated, to produce patent or latent defects in the completed work.

D. When a submittal is marked with an “action,” the Contractor shall submit multiple copies. This will allow for copies to be returned to the Contractor's on-site representative. Otherwise, no return will be made.

3.07 GOVERNMENT SUBMITTAL REVIEW

A. General:

1. Review Period:
   a. The Government ‘s review period for construction submittals (including RFIs) is thirty (30) calendar days following the Government’s receipt of all copies of documents (electronic, hard copies, samples, certificates, etc.) required for the submittal..
   b. The Contractor shall submit construction submittals in accommodation of the full review period and prior to the planned commencement of the procurement and work activity.
   c. No work shown on the submittals shall be executed within the review period without prerequisite acceptance by the Project Director/COR.
2. The Government’s acceptance of submittals reflects an acknowledgement that the submittal is in general compliance with the intent of the Contract documents. Acceptance by the Government will not:
   a. Permit any departure from the Contract requirements.
   b. Relieve the Contractor of the responsibility for patent or latent errors and omissions, including details, dimensions, material, etc.
   c. Authorize a departure from the details appearing on accepted construction specifications and drawings.
3. Upon acceptance of each submittal, the Government will have unlimited rights to all drawings, specifications, notes and other work developed in the execution of the works.

B. Submittal Disposition: Submissions will be reviewed only for general compliance with intent of Contract Documents and with information given therein. Acceptance does not relieve Contractor from responsibility for any errors or omissions in submittals, nor from responsibility for complying with requirements of Contract. As a result of review, Project Director/COR will mark submittals as follows:

1. ACCEPTED AS SUBMITTED (AS) or ACCEPTED AS NOTED (AN): Indicates there is no requirement for resubmittal, items require only Government recognition, submittal meets the intent of the Contract documents, and final acceptance will depend upon compliance.
2. ACCEPTED FOR INFORMATION ONLY (IO): Indicates the submittal is accepted without waiving the requirement for compliance with the Contract Documents and final acceptance will depend upon compliance.
3. REJECTED; RESUBMIT (RR):

a. Indicates the submittal does not meet the Contract's intent or corrections are required of the proposed work's defects or deficiencies as represented by the submittal.
b. The Contractor shall not proceed with the purchase, fabrication, delivery, or other related execution of the work until acceptance is granted.
c. The Contractor shall not allow the use or evidence of rejected submittals where work is in progress at the Project Site or elsewhere.
d. Correction of noted defects or deficiencies shall be resubmitted for the Government's acceptance.
e. The Contractor shall bear all risk in the submittal-rejection-re-submittal cycle. Submittal rejection will not justify extension of Contract duration.

4. The disposition of each submittal will be reflected in the Submittal Register in ProjNet. The presence of the disposition status in ProjNet will constitute notification of disposition to the Contractor.

3.08 SUPPLEMENTS

A. The supplements listed below, are a part of this Specification:

1. Material/Product Substitution Request Form.
2. Sample Submittal Register

MATERIAL/PRODUCT SUBSTITUTION REQUEST FORM _____

Project:

_____

Contractor:

_____

Within 30 days after the construction NTP, this formal request will be considered for substitution of products specified as minimum standard. After the end of this period, substitution requests will be considered only if the specified product or material is no longer available or deemed unsatisfactory for the intended function.

Specified Material/Product_____

Specification Division – Section _____

Specified Manufacturer/Origin _____

Proposed Substitution _____

Proposed Manufacturer/Origin _____

Proposed Supplier/Source _____

Attached hereto are the specification, data, performance documents and standard laboratory test results supporting the product substitution.

The following criteria has been taken into consideration

- The use of this material/product is applicable to this product in the prescribed location and will be warranted in the same manner as the specified product for a period of ___ years, when applied and used as per the manufacturers guidelines.
- The substitution of this product will not affect the dimensions shown on the drawing in any way.
- This product substitution will not affect the work of other trades working on this product.
- This product will not affect the expected Commissioning Functional Performance Test results.

The advantages of incorporating the proposed substitution into this Project are as follows: _____

_____

_____

Submitted By: _____**of**_____

T**his completed form is to be sent to OBO Project Director with the required submittal.**

SAMPLE SUBMITTAL REGISTER

PROJECT, LOCATION, NUMBER

New Office Building Compound

ABC Land

XJ-AA-1234

CONTRACT NUMBER

S-OBO-AD-14-01234

REPORT DATE

SPECIFICATION		ITEM			DATES			
SECTION	PARA	No./ Rev	TYPE	DESCRIPTION	NEED BY	SUBMITTED	RETURNED	ACTION

SECTION 013525
CONSTRUCTION SAFETY AND OCCUPATIONAL HEALTH

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies Contractor responsibilities for providing safety and occupational health for all persons authorized to be at the Project Site and protection of property on and adjacent to the Project Site. The Contractor is responsible for ensuring subcontractor compliance with the safety and occupational health requirements contained in this specification.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including Federal Acquisition Regulation (FAR) clauses by reference or as amended in Contract Sections B through J, Contract Drawings and Technical Specifications and other Division 1 Sections of these Contract Specifications apply to requirements of this Section

B. Regulations and Standards: One or more clauses by reference in this document will have the same force and effect as if the full text was contained. Governing regulations and specific technical safety and health requirements for work performed at the Project Site and incorporated into this construction safety and occupational health program include specifc compliance with the latest edition, U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM 385-1-1. This document is available at the U.S. Government Printing Office, Washington D.C.

1.

1. U.S. Department of State Foreign Affairs Manual 15 FAM 960, Safety Health and Environmental Management Program, with latest changes.
2. NFPA Code 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
3. ANSI A10 Series Standards for Safety Requirements for Construction and Demolition.
4. NFPA Code 51B, Standard for Fire Prevention during Welding, Cutting, and Other Hot Work.
5. NFPA 10, Standard for Portable Fire Extinguishers.
6. NFPA 70, National Electrical Code
7. OBO C&C Administrative Bulletin A-07-08 dated 21 November 2007.
8. Title 48 - Federal Acquisition Regulations System: Chapter 6, DOS, Part 652.236-70 (Accident Prevention).
9. Title 48 - Federal Acquisition Regulations System: Part 52.236-13 (Accident Prevention).

10. U.S. Occupational Safety and Health Standards (OSHA) Temporary Labor Camp Standards – 1910.142, if applicable.

1.03 DEFINITIONS

A. Refer to Chapter 2 of the OBO ICS, IBC for definitions of all safety-related terms specifically, Designated Authority, Hazard, Activity Hazard Analysis, Position Hazard Analysis, Qualified Person, and Confined Space.

B. Lavatory: A basin or similar vessel for washing hands, arms, face and head. Sixty (60) centimeter diameter (24 inch) basin rims shall be equal to one lavatory.

C. Toilet Facilities: Enclosures containing one or more toilet fixtures or commodes for the purpose of defecation, urination, or both.

D. Urinal: A toilet fixture maintained within a toilet room for the sole purpose of urination.

E. Competent Person Safety: One who can identify existing and predictable hazards in the working conditions that are dangerous to personnel and who has authorization to take prompt corrective measures to eliminate them.

F. Competent Person for Confined Space**:** A person with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, designated in writing by the employer to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and who has the authority to take prompt corrective measures with regard to such hazards.

G. Competent Person for Evacuation/Trenching: A person meeting the competent person requirements as defined in the definitions of EM 385-1-1 and 29 CFR Part 1926, who has been designated in writing, by the employer, to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

H. Competent Person for Fall Protection: A person designated in writing by the employer to be responsible for the immediate supervision, implementation and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

I. Qualified Electrical Person: One who has received training in and has demonstrated skills and knowledge in the construction and operation of electrical equipment and installations and the hazards involved. This includes the skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment to determine voltages and clearances necessary for the safe execution of the work.

1.04 SUBMITTALS

A. The Contractor shall submit, in accordance with Section 013305, Construction Submittals, the following: Resume of the proposed Safety and Health Program Manager (SHPM) for review by the OBO/Project Director/COR.

1. A Construction Accident Prevention Plan (CAPP) prior to the beginning construction activity at the Project Site.
2. Submit the Fall Protection and Prevention Plan with the CAPP, and update every six (6) months.
3. Activity Hazard Analysis: Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) sub-contractors performing that work activity shall prepare an AHA. AHA's shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk. Work shall not begin until the AHA for the work activity has been accepted by the OBO/ Project Director and discussed with all engaged in the activity, including sub-contractors, and at preparatory and initial control phase meetings. The names of the Competent/Qualified Person(s) required for a particular activity (for example, evacuations, scaffolding, fall protection, and other activities as specified by EM 385-1-1 shall be identified and included in the AHA. Proof of their competency/qualification shall be submitted to the OBO/ Project Director for acceptance prior to the start of that work activity. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
4. Position (Worker) Hazard Analysis (PHA) shall be prepared, updated as necessary, documented , and reviewed by the SHPM for hazards associated with position's task. A completed PHA document shall indicate that the hazards, control mechanisms, Personal Protective Equipment (PPE) and training required for the position were discussed with the employee, and the PHA shall be signed by the SHPM and employee. A PHA shall contain a copy of the employee's training certificate of completion for all required training. Supervisors shall review the contents of PHA with employees upon initial assignment to a position, and whenever there is a significant change in hazards.
5. Heat Stress Plan : OBO projects in African, Middle Eastern and South Asian countries where ambient temperatures above 40 degrees Celsius are the norm during the year the contractor will submit a plan as to how they will

mitigate the dangers of heat stress at all times with an emphasis on regular hydration and periods of rest.

6. Hazardous Work Permit Requests.
7. Material Safety Data Sheets (MSDS). Refer to requirements of USACE EM 385-1-1.
8. Minutes of Safety Related Meetings.
9. Records of Safety and Health Inspections: The Contractor shall make records of inspections available to the Project Director/COR.
9. Accident Investigation Report: Report within 24 hours of each accident. The Contractor shall report/submit an accident/incident on Form DS 1663 for all accidents that require medical attention beyond first aid. This will include all incidents that meet the OSHA definition of "Recordable Incidents".
10. Potable Water Documentation: On a monthly basis, substantiation that potable water is safe for human consumption.

1.05 SAFETY OFFICIALS

A. Safety and Health Program Manager (SHPM)

1. Prior to commencing on-site construction activities, the Contractor shall assign a qualified full-time SHPM whose sole duties shall be effective implementation, coordination, and enforcement of the Construction Accident Prevention Plan (CAPP). The SHPM shall be on-site at all times when work is being performed. The SHPM shall report to a senior project, or corporate, official of the company.
2. The Contractor shall provide an SHPM for the duration of the contract. Notices posted at the Project Site shall name the SHPM and describe the authority and responsibility held by the position.
3. The SHPM shall meet the following qualifications:
   a. Be a U.S. Citizen
   b. Completed the 30 hour OSHA construction safety class.
   c. Five (5) years as a site construction safety manager specifically on projects involving the construction of large concrete commercial /residential buildings, heavy highway and road or concrete bridge works. He/She must also possess a Certified Safety Professional (CSP) certificate. Further the SHPM shall be fully knowledgeable regarding all sections in the latest edition of the U.S. Army Corps of Engineers Safety & Health Requirements Manual EM385-1-1 that are relevant to OBO construction site operations. The SHPM shall be qualified/cognizant to anticipate, identify evaluate, and implement corrective action through activity/worker hazard analysis, worker training, proactive over-site of construction operations to abate or reduce potential safety and health hazards and dangerous environmental exposures.

B. Assistant: Project sites with non-English speaking workers shall have a person(s), fluent in the language(s) spoken as well as English, on site when work is being performed, to interpret and translate as needed. Therefore the SHPM

shall have a full-time local hire for translation and field support as necessary and appropriate.

C. Local Contractor Safety Officer: Local sub-contractors shall also hire a full time local Safety Officer who will assist with language translation and safety support to the SHPM in overall construction safety operations. There shall be at a minimum of one Local Contractor Safety Officer per 40 workers (not including management staff) on the project site.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. For the duration of construction, the Contractor shall implement and manage a comprehensive safety and health program covering both existing and developing conditions.

B. The Project Director/COR, as the Government Contracting Officer's Representative, reserves the right to suspend work when and where the Contractor's safety and health program is operating in an inadequate manner, has severe shortcomings, or is not in compliance with contractual requirements. This will include failures to complete required submittals within the time periods specified.

C. Acceptance by the Project Director/COR will not relieve the Contractor of overall responsibility for compliance with the strict interpretation of all safety and health requirements of the Contract.

D. A protocol mutually agreed upon by the Contractor and OBO, shall be established for the removal of workers and supervisors who have been found guilty of repeatedly committing egregious safety violations and deficiencies.

E. Safety and Health Regulations:

1. The Contractor shall establish and enforce clearly written, definitive rules for employees of the Contractor, subcontractors, and separate contractors at the Project Site, applicable for performance of each unit of work.
2. The Contractor shall prominently post notices in English, the host national language, and third country languages stating, if appropriate, that failure to comply with safety and health regulations may cause immediate termination of employment.
3. The Contractor shall post safety and health rules at the Project Site and provide a copy to the Project Manager for each subcontractor prior to the commencement of work.

F. Joint Safety and Health Committee: Prior to commencing construction activities, the Contractor shall establish a functioning Joint Safety and Health Committee including management or supervisory personnel that are one step below the superintendent for a specific trade, subcontractors and Government representatives as needed. The Joint Safety and Health Committee, chaired by the SHPM, shall meet bi-monthly to:

1. Coordinate management of safety and health activities and actions for effective protection.
2. Determine implementation of new safety and health measures related to forthcoming construction activities.
3. Anticipate and analyze potentially hazardous conditions and implement safe and healthy solutions.
4. Perform Activity and Job Hazard Analysis for work activities involving unusual construction operations, work practices, or work involving hazardous materials. Develop methods and procedures to reduce identified hazards to greatest extent possible.
5. Review the Fall Protection and Prevention Plan.

G. Inspections

1. Identified safety and health issues and deficiencies, and the actions, timetable, and responsibility for correcting the deficiencies, shall be recorded in inspection reports. Follow-up inspections to ensure correction of any identified deficiencies must also be conducted and documented in inspection reports.
2. The SHPM shall establish a safety and occupational health deficiency tracking system that lists and monitors the status of safety and health deficiencies in chronological order, be updated daily, and should provide the following information:
   a. Date deficiency identified;
   b. Description of deficiency;
   c. Name of person responsible for correcting deficiency;
   d. Projected resolution date;
   e. Date actually resolved.
3. The Contractor shall conduct frequent safety, health, and housekeeping inspections of temporary structures, fabrication shops, material, machinery, and equipment at the Project Site.
4. Inspections and documentation of such shall be performed by qualified persons.
5. Documentation shall include any deficiencies encountered along with details and a timetable for corrective action.
6. The SHPM shall identify and coordinate all safety, health, and housekeeping inspections, and shall verify, document, and ensure that all corrective actions have been implemented.
7. Records of inspection shall include documentation of safety, health, and housekeeping inspections, and corrective actions and timetables associated

with any deficiencies encountered. Documentation shall also be made available for verification that corrective actions were implemented.

H. Accident Investigation:

1. The Contractor shall investigate and prepare a separate accident report for each incident resulting in lost time, medical treatment beyond first aid, disabling or fatal injuries, or damage to vehicles, property, materials, supplies, furniture, fixtures, and equipment.
2. The Contractor shall prepare reports on forms supplied by and in accordance with the instructions of the Project Director/COR.
3. Except as may be otherwise requested by the Project Director/COR, the Contractor shall report on Form (3-92) DS-1663 (related instruction sheet shall be available from the Project Director/COR).
4. In each report, the Contractor shall include a statement of Contractor actions taken to prevent recurrence of accident.

I. Near Miss Reporting

1. The Contractor shall establish a program to report and record, “near miss” incidents and unsafe acts that resulted or could have resulted in damage to equipment, machinery or property or had the effect of narrowly injuring or killing a worker.
2. The Contractor shall in a timely manner identify and investigate the root causes of each incident or unsafe act and follow up to prevent reoccurrence.
3. The Contractor shall provide instruction to supervisors and workers on how to report “near miss” incidents and unsafe acts.
4. The Contractor to share near miss incidents and unsafe acts with employees by informing them at weekly tool box meetings how the incident or unsafe act occurred and what actions are being taken to prevent reoccurrence.

J. Hazardous Materials: The Contractor shall test any material encountered suspected to contain hazardous substances and bring to the immediate attention of the Project Director/COR. If, in the opinion of the Project Director/COR, the Contractor is not conducting sufficient testing, more may be required.

K. Hazardous Work Permits: The Contractor shall prepare written requests and obtain permits to perform the following construction operations:

1. Hot Work: Includes all work that results in an open flame such as welding, cutting, brazing, and burning. Effective fire protection and prevention shall be provided at all times during such operations.
2. Confined Space Entry: Includes work in enclosed areas such as storage tanks, bins, sewers, in-ground vaults, boilers, vessels, tunnels, manholes, and pits.

3. Internal Combustion Engines: Includes use of trucks, forklifts, pumps, or generators powered by petroleum-based fuel when used inside a building, structure, or confined space.
4. Explosive Actuated Tools: Includes power-charged tools manufactured by Hilti, Remington, Ram Set, and others used for fastening purposes.
5. Explosives (if applicable): Follow all applicable U.S. and local government regulations. In all cases close coordination with controlling officials shall be effected.

L. Protective Clothing and Equipment (PCE): The Contractor shall issue personal protective clothing and equipment as required by EM 385-1-1. Leather boots and coveralls must be worn by all employees engaged in construction work at the Project Site. All items (PCE) shall be maintained in a serviceable condition.

M. Safety and Health Training:

1. General Orientation: The Contractor shall provide an orientation for new employees regarding safety and health policies and work rules.
2. Specific Training:
   a. The Contractor shall provide specific training to supervisory personnel and all craft workers of the Contractor and subcontractors regarding the proper use and care of specific personal protective gear, equipment, and clothing.
   b. The Contractor shall provide specific training regarding the proper use of the full body harness and lanyard attachments. This training shall be provided to all craft workers performing tasks at elevations above 10 feet.
   c. Contractor and subcontractor employees shall be trained and supervised by persons qualified to perform, safely and confidently, recognized hazardous work operations and work performed with hazardous conditions.

N. Tool Box Meetings: The Contractor shall conduct weekly safety meetings. The Contractor shall require attendance by all tradespersons, laborers, foremen, and supervisors at the Project Site, including those of separate contractors. The Contractor shall discuss current construction operations, analyze hazards, and communicate solutions.

3.02 CONSTRUCTION ACCIDENT PREVENTION PLAN (CAPP)

A. Prior to beginning work at the Project Site, the Contractor shall prepare and submit to the Project Director/COR, a site-specific CAPP covering all activities for the Contractor and all subcontractors. The CAPP shall address the phasing and implementation of the complete safety, health, hygiene, and accident prevention program beginning with the first day of activity on the Site. The CAPP shall be coordinated with the Site Utilization Plan. Throughout the duration of the Project, the Contractor shall follow the accepted CAPP (or as revised with prior approval of the Project Director/COR).

B. The CAPP shall contain, at a minimum, the Contractor's understanding of:

1. Management and Corporate Commitment: The Contractor shall include a certified statement in the introduction, executed by a senior officer of the construction firm having broad corporate authority, indicating full commitment to the accepted CAPP and the level of authority in assignment of responsibilities at the Project Site.
2. Name, qualifications, and duties of SHPM.
3. Concept of the Joint Health and Safety Committee, its makeup, and functions.
4. Requirements and details for conducting meetings and inspections.
5. Activity and Position Hazard Analyses: The procedure for preparation and approval prior to proceeding with work involving unusual construction operations, work practices, or hazardous materials. The Contractor is encouraged to teach and assign site supervisors the responsibility to develop the AHAs and PHAs.
6. Hazardous Work Permits: The procedure for preparation and approval prior to proceeding with work deemed hazardous.
7. Safety and Health Training: The procedures for implementing training and orientation.
8. Fall Protection and Prevention Plan: The Contractor shall incorporate into the CAPP a site specific Fall Protection and Prevention Plan for personnel exposed to fall hazards and using fall protection equipment.
9. Emergency Plan: The Contractor shall solicit advice and recommendations from the Project Director/COR, Site Security Manager, and Regional Security Officer (RSO) in preparation of the Emergency plan to include:
    a. Escape procedures and routes, method of accounting for employees following emergency evacuation, identification of source and location for rescue and medical assistance, means of reporting emergencies, and persons to be contacted for information or clarification.
    b. Total system response capabilities to minimize consequences of accidents, natural disasters, or other emergencies.
    c. Emergency Resources - Establish jointly with the Government, a list of telephone numbers and locations of ambulance, physician, hospital, fire, police, and other sources of emergency assistance. This list shall be posted conspicuously in several locations on the Project Site.
    d. Emergency communication-wireless telephone service shall be the preferred method of emergency communications. Emergency communication access shall be available to Site medical personnel and the nearby medical clinic or hospital.
    e. Quarterly Testing - Test emergency plans quarterly using drills to ascertain and ensure effectiveness.
    f. Integration of on-site emergency planning with off-site emergency support.
    g. Limit the number of persons permitted in any location to rescue and escape capability, as determined by the Contractor and in concurrence with the Project Director/COR.

h. Emergency Alert System - Identify, select, install, and test the system to alert all persons likely to be affected by existing or imminent disaster conditions, and to alert and summon personnel and equipment comprising emergency response capability.

3.03 TOOLS, EQUIPMENT, AND MACHINERY

A. Quality: Hand tools, power tools, equipment, machinery, materials, and personal protective apparatus utilized by the Contractor and all subcontractors shall be of a manufacturer listed by a U.S. or internationally recognized testing laboratory and be for the specific application for which they are to be used. They shall be quality products recognized for professional construction use, applications, and work practices.

B. Safe Clearance Procedure: Prior to initial use, and periodically thereafter at times of continued use, the Contractor shall provide inspections of construction tools, equipment, and machinery. The Contractor shall not permit continued use of tools, equipment, and machinery that are not in satisfactory working condition. Immediately upon identification of damage or malfunction, the items shall be tagged and removed from the Project Site. The Contractor shall not allow the return of items until they have been repaired or reprocessed in compliance with industry practice. The Contractor shall engage qualified persons to make such inspections and repairs. The Contractor shall prepare written records, including recommendations for corrections of defects and misapplication.

C. Machinery and Mechanized Equipment:

1. Prior to use, all machinery and mechanized equipment shall be inspected and tested by qualified personnel and certified to be in safe operating condition. Records of tests and inspections shall be maintained at the Project Site and become part of the official Project file.
2. Tower cranes, crawler cranes, truck and wheel mounted cranes, and material hoists shall be erected, tested, maintained, and repaired in accordance with the manufacturer's recommendations. All such actions shall be documented. Operators of vehicles and mechanized equipment must be trained and certified. Every person operating a motor vehicle shall possess at all times, a license or permit certification that affirms valid qualifications for the equipment being operated. See Section 16 of the USACE manual for heavy mechanized equipment cranes.
3. The Contractor shall have tower cranes inspected quarterly by entities accepted by the manufacturer. The inspection shall ensure operation and structural integrity in accordance with manufacturer's recommendations (see EM 385-1-1, latest edition).
4. Hoisting Equipment: The Contractor shall provide a general-use manufactured apparatus for hoisting and material handling that is suitable for project configuration. The equipment shall be sufficient for the number of stories and the handling of materials, fabrications, tools, equipment, work

platforms, and, the transportation of crafts persons between grade and floor levels (see EM 385-1-1, latest edition).

D. Electrical Work

1. The Qualified Electrical Person is responsible for determining the number of workers required to perform the job safely and shall identify work hazards and controls in a corresponding Activity Hazard Analysis.
2. All electrical work shall comply with applicable National Electrical Safety Code (NESC), National Electrical Code (NEC) and OSHA.
3. Electrical work shall be performed by qualified personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and or local certifications and/or licenses that a Master or Journeyman Electrician may hold.
4. Before work is begun a Qualified Electrical Person in charge shall ascertain by inquiry, direct observation, or by instruments whether any part of an electrical power circuit either exposed or concealed is located such that the performance of work could bring any person, tool or machine into physical or electrical contact with it.
5. Whenever possible all equipment and circuits to be worked on shall be de-energized before work is started and personnel protected by clearance procedures, lockout/ tag out and grounding.
6. Energized work may never be performed without prior authorization. When it is determined that equipment must be worked on in an energized condition, a hazardous work permit shall be submitted in advance to the Project Director/COR for acceptance.

E. Walking and Working Surfaces:

1. Scaffolding shall be a standard, medium to heavy-duty welded tubular frame or a project-designed steel tube and clamp system. Tube and coupler scaffolding using the folding technique are forbidden. All components of scaffolding shall be manufactured and tested according to international standards. All types of manufactured scaffolding systems shall include the scaffold manufacturer's integrated access stairway sections, handrails, and walking platforms. Components from different manufacturers shall not be interchanged to form a complete system.
2. For all cast-in-place concrete installations of walls, columns, beams, and slabs, the Contractor shall provide manufacturer's standard access scaffolding and work platforms which are an integral part of a pre-engineered, reusable, factory-built concrete forming and shoring system. This system shall consist of pre-fabricated modular metal framed plywood or all metal panels. Components from different manufacturers shall not be interchanged to form a complete system.
3. Harnesses with a twist style locking device are forbidden. The Contractor shall provide harnesses with snap-hooks or carabiner that are self closing, self-locking and capable of being opened by at least 2 consecutive deliberate actions per EM 385-1-1, paragraph 21.H.05.d.(3).(a).

4. The Contractor shall protect openings in floor slabs of more than 0.03 square meters (46 square inches) in area. When located more than 1.25 meters (4 feet) above grade or adjoining floor or deck surface, the Contractor shall provide guardrails at floor slab edges that are not yet permanently walled off.

F. Access to Construction Operations:

1. The Contractor shall provide ramps, stairs, ladders, and similar devices for craftspersons, inspectors, authorized visitors, and Government personnel for access and egress.
2. The use of job-made “portable” step ladders is prohibited on all OBO construction Project Sites. Contractors must provide commercially manufactured fiberglass stepladders that meet the American National Standards Institute (ANSI) Type II, Commercial 225-lb duty rating.

G. Noise Reduction: The Contractor shall minimize the generation of noises through the efficient and shielded use of materials, tools, processes, and procedures. The Contractor shall restrict the use of noise or impact-producing tools. The actions shall seek to minimize complaints from nearby occupancies and comply with requests of local authorities.

3.04 SITE MAINTENANCE, PROTECTION, AND SANITATION

A. General: The Contractor shall provide indirect, work-related, temporary support facilities and services as described below in conjunction with performance of work at the Project Site.

1. The Contractor shall comply with the host country governing regulations as enforced by authorities. These regulations include building codes, requirements of utility companies, health and safety regulations by police, rescue, and fire departments, environmental protection regulations, and similar applicable regulations.
2. Inspections: The Contractor shall arrange for required inspections, certifications, and permits for installation. The Project Director/COR shall be kept informed of all progress.
3. The Contractor shall maintain temporary facilities in clean, sanitary, and safe operating conditions to the satisfaction of the Project Director/COR. The Contractor shall not allow conditions of use to become inefficient, overloaded, hazardous, or otherwise deleterious to the Government's interests.

B. Fire Protection:

1. Except as otherwise indicated, the Contractor shall expedite, complete, and place into service permanent fire protection system and equipment.
2. Prior to the time permanent facilities are placed into service, the Contractor shall provide temporary fire protection facilities adequate for conditions at the Project Site.

3. Where possible, the Contractor shall arrange jointly with the Project Director/COR and local fire department to respond to calls for assistance and service in cases of fire emergency.
4. The Contractor shall provide temporary portable fire extinguishers, complying with applicable provisions of NFPA 10, Standard for Portable Fire Extinguishers, multi-purpose dry chemical type, 5.0 kg size, UL-rated "4-A:60-B:C." The Contractor shall maintain unobstructed access to fire extinguishers at each prime point of access to each story of construction and at each principal office, lunch room, fabrication shop, storage enclosure, gate, guard house, and similar temporary facility at the Project Site.
5. The Contractor shall prohibit smoking, except in designated areas identified by the Project Director/COR.
6. During welding, cutting, and burning, the Contractor shall comply with NFPA 51B in areas of fire-hazard exposure. The Contractor shall provide stand-by fire-protection personnel and adequate supervision of operations.

C. First Aid Medical Facility Requirements:

1. All construction Project Sites where more than 300 workers are anticipated (greatest total number of employees on a shift) shall establish and equip an infirmary prior to Construction NTP and as directed by a Licensed Physician (LP).
2. All construction Project Sites where more than 99 but fewer than 300 workers are anticipated (greatest total number of employees on a shift) shall establish and equip a first aid station, as directed by a Licensed Physician (LP). In non-rural locations, medical clinics and hospitals within five minutes of an injury location may be accepted for use.
3. All construction Project Sites where fewer than 100 workers are anticipated (greatest total number of employees on a shift), and where neither a first aid station nor an infirmary is available, shall be provided with a first aid kit for every 25 (or fewer) employees. A health care professional or competent first aid person shall evaluate and determine the fill contents of each kit.
4. The Contractor shall provide, place, and test periodically one (1) Automatic External Defibrillator (AED) in the Contractor's Project Site office, one (1) in OBO's Project Site office, and one (1) in the first aid station on-site. A CPR/AED training program shall be given to two (2) persons at each location who shall receive certification in first aid and CPR from the American Red Cross, the American Heart Association, or from an organization whose training adheres to the standards of the International Liaison Committee on Resuscitation. CPR/AED training shall contain a hands-on component. A certificate shall state the date of issue and length of validity.

D. Barricades, Closures, and Traffic Control:

1. The Contractor shall provide substantial barricade-type closures and guard rails at locations where encroachment of a physically hazardous condition in

construction is possible. The closures and guard rails shall protect equipment, tradespersons, and others at or adjoining the Project Site.

2. The Contractor shall provide a sidewalk bridge-type protective structure where vehicular and pedestrian traffic cannot be excluded from hazardous areas under and nearby overhead work in progress.
3. The Contractor shall provide appropriate warning signs, flashing warning lights, and adequate general lighting at principal barricades. The barricades are not intended to be crash-proof.
4. The Contractor shall maintain barricades through periods of exposure to hazardous conditions.

E. Roadways, Walkways and Parking:

1. The Contractor shall establish safe roadways and walkways in and around the Project Site and connecting adjoining public thoroughfares.
2. The Contractor shall provide signage and other markings including traffic control signage and signals as necessary and useful in controlling and restricting traffic from passing through other areas. The Contractor shall cooperate with local officials in the establishment and adjustments of street entrance and exit signals and signs.
3. The Contractor shall not allow established traffic passages to become encumbered or obstructed with work activities, materials, parked vehicles, equipment, and similar elements. In particular, the Contractor shall keep established entrance and exit passages clear for medical emergencies, escape, fire fighting, and other emergency access and egress.
4. Parking: Privately owned vehicles are prohibited from entering the construction Site or interfering with construction activities.

F. Environmental Protection: The Contractor shall provide facilities and services as required by governing authorities to protect the environment. The Contractor shall minimize the generation of wastes and avoid environmental pollution. The Contractor shall prohibit the discharging and accidental loss of substances from the construction process that could contaminate the atmosphere, surface or ground water, soil, or subsoil.

G. Excavation and Demolition:

1. Prior to commencement of excavation or demolition, the Contractor shall give notices to adjoining landowners or other parties as required.
2. The Contractor shall review and comply with EM 385-1-1 Section 23 “Demolition”.
3. Before excavation or demolition, the Contractor shall examine the structural condition of all adjacent structures or infrastructure, on-site and on adjoining property. Where there is reason to believe planned excavation or demolition shall cause damage to adjacent structures or infrastructure or result in unsafe conditions, the Contractor shall cease excavation or demolition operations until means have been provided to insure stability and safety. Such means may consist of sheet piling, shoring, bracing, underpinning, or the equivalent.

4. Other protective provisions may include, at a minimum, temporary protective coverings or enclosures of adjoining work, warning signs, and similar provisions.

H. Dust Control: Where and when applicable, the Contractor shall implement a suitable program for dust control in and around the Project Site, designed to reduce dust generation and distribution to reasonable levels. This program shall coordinate with the environmental protection program.

I. Rodent, Pest, and Vermin Control: The Contractor shall employ integrated pest management practices that emphasize avoiding conditions that attract pests to eliminate or minimize pest problems at Project Site. Eliminate habitats of existing pests and avoid creation of pests common to the area. Use the least hazardous means to reduce pest populations. When pesticides are needed, use only pesticides approved by SHEM and apply them in a targeted manner. Provide pesticide labels and material safety and data sheets for review and approval at least 72 hours prior to planned application on the site.

J. Potable Water: Where reasonably possible, the Contractor shall provide potable water for all requirements of the construction period. Where and when that is not possible, potable water for drinking and other uses shall be provided where specified. Potable water supplies shall be clearly marked with signage in multiple languages as appropriate for the Site location. The Contractor shall source potable water from city-controlled piped water, a well on-site, commercially bottled water, or other reliable source. The Contractor shall test and report on a monthly basis that the potable water from all selected sources is safe for human consumption. Piping of temporary potable water systems shall be sterilized prior to use.

K. Construction Site Sanitation and Health Facilities:

1. Facilities for workers shall be completed and ready to use prior to the start of construction..
2. The Contractor is encouraged to utilize semi-permanent or portable facilities where possible in compliance with the requirements of this Section.
3. The Contractor shall provide temporary facilities for workers. Lunchrooms, toilets, first aid facility, change rooms, and lockers shall be constructed using newly manufactured materials.
4. Toilets Facilities and Restrooms:

    a. As practicable, locate toilet facilities within sixty-one (61) meters (200 feet) of all locations where work is regularly being performed.
    b. Design the number of toilet fixtures around the anticipated maximum number of workers at the Project Site and allow accessibility to all employees.
    c. The construction and installation of toilet facilities shall be acceptable to the Project Director/COR and shall be in compliance with applicable jurisdictional codes.

d. The Contractor shall ensure that the type of toilet and water access (e.g., commode vs. squat toilet) is culturally acceptable to the workforce.
e. All surface finishes shall be chosen to facilitate cleaning and the maintenance of the highest standards of sanitation.
f. Each toilet or commode shall occupy a separate compartment or stall equipped with a door and latch. Walls of compartments, stalls, or partitions between the toilets or commodes may be less than the height of room walls, but the top shall not be less than one hundred seventy three (173) centimeters (5 feet, 8 inches) from the floor and the bottom not more than thirty (30) centimeters (1 foot) above the floor.
g. In all newly constructed toilet rooms, the floors and exterior walls to a height of fifteen (15) centimeters (6 inches) above the floor shall be of watertight construction to facilitate cleaning and sanitation.
h. Install toilet fixtures, commodes, and urinals such that the space around and behind the fixture can be easily cleaned.
i. Label facilities properly in English and the commonly understood local language. Pictograms shall be used.
j. Provide hand-washing lavatories in close proximity to all toilet facilities
k. Maintain an adequate supply of toilet paper and paper towels at all times.
l. Comply with the requirements of the authority having jurisdiction for sewage disposal. Where non-sewer waste disposal systems are permitted, they shall be of a type accepted by the local health authorities having jurisdiction. Maintain all disposal systems in a sanitary condition.

5. Lavatories and Personal Washing Facilities:
   a. The Contractor shall provide adequate facilities for maintaining personal cleanliness at the Project Site. These facilities shall be convenient for employee access and maintained in a sanitary condition.
6. Drinking Fountains and Dispensers:
   a. The Contractor shall provide an adequate number distributed around the Project Site and service support areas for convenience and efficiency. An adequate supply of sanitary disposable paper cups and waste receptacles shall be maintained at each water dispenser.
   b. The Contractor shall provide bottled drinking water where piped potable water service is not available.
7. Changing Rooms:
   a. The Contractor shall provide changing or dressing rooms with individual bins, shower hooks, benches, and curtains, if applicable, to enable all workers to change between street clothing and work clothing.
   b. Street and work clothing shall not be stored in contact with each other.
8. Lunch Rooms, Mess Halls, Dining Facilities, and Food Service Operations:

a. The U.S. Department of State, in the promotion of the fair and equitable treatment of the foreign construction workforce on OBO Project Sites, has adopted internationally recognized nutritional and health requirements for manual labor occupations. The Contractor shall ensure that a luncheon meal of 1500 calories is provided each day during the normal workday shift at no cost to the worker. The Contractor shall comply with local regulations more stringent than the requirements provided in this clause. See the January 2004 Report of the Joint FAO / WHO/ UNU; Food and Agriculture Organization World Health Organization and the United Nations University.

b. All food service facilities and operations used for food preparation on and off-site shall be maintained in clean and sanitary condition and inspected by a qualified health official. All food service personnel shall be given a health exam quarterly. The testing facility shall be approved by the Project Director/COR.

c. An enclosed facility specifically for employees to eat lunch shall be provided at the Project Site. The minimum area per person shall be specified as 1.0 square meter or 11 square feet. The facility shall accommodate 50 percent of the maximum number of non-office-occupant personnel anticipated and authorized to be at Project Site at one time.

d. The facility shall be equipped with tables and chairs or benches to seat the number of persons anticipated. The Contractor shall provide suitable floor, wall, and ceiling finishes, doors and windows, screening, and suitable fixtures and accessories. All tabletop surfaces shall be made of a laminated and impervious material that can be easily washed. General lighting, HVAC system, and drinking fountains or dispensers shall be provided. Food service areas shall have an ample supply of hot (43°-60°C or 110°-140°F) running water.

e. The Contractor shall physically separate dining facilities from toilets at a minimum distance of sixty-one (61) meters (200 feet) and from all locations where there is the threat of exposure to toxic or infectious materials.

f. For workers bringing lunches to the Site, the Contractor shall provide refrigeration facilities capable of maintaining a temperature of 7°C or 45°F or lower for the storage of lunches prior to consumption.

9. Waste Handling and Janitorial Services:

a. The Contractor shall provide proper and adequate segregated waste containers for the collection and removal of waste materials in different categories. These categories include, but are not limited to, hazardous wastes, flammable wastes, sanitary and health-care wastes, garbage, wastes for recycling as required by local authorities, inert and dry wastes, and incidental debris from the construction process.

b. The Contractor shall dispose of general non-organic wastes at maximum seven (7) day intervals.

c. The Contractor shall dispose of organic, garbage, and similar temperature-sensitive wastes at maximum three (3) day intervals when the average outdoor daily maximum temperature can be expected to be above 18°C.
d. The Contractor shall clean waste containers regularly and adequately.
e. The Contractor shall dispose of wastes in a lawful manner.
f. The Contractor shall maintain a Site clean and clear of accumulated wastes, including surplus materials, trimmings, incidental demolished work, and construction debris. The Contractor shall clean completed elements and portions of work and maintain in broom-clean condition.
g. Janitorial Services:
    1) The Contractor shall provide on a daily basis, including restocking of disposable products, for the maintenance of temporary offices, security spaces, toilets, first aid rooms, lunchrooms, shower/locker rooms, and similar facilities.
    2) Toilet and first aid room fixtures and floors and floors and walls of shower rooms shall be scrubbed daily.
    3) The Contractor shall provide weekly cleaning, damp mopping, or vacuuming for other floors, as applicable.
    4) The Contractor shall provide monthly washing of windows and cleaning of other walls, ceilings, light fixtures, and similar facility surfaces.
    5) The Contractor shall extend janitorial services to include permanent facilities as authorized for use at temporary facilities.

END OF SECTION

SECTION 013550
CONSTRUCTION SECURITY

PART 1 GENERAL

1.01 SUMMARY

A. This Section and its attachments provide explanation to the Contractor regarding labor requirements and the security of classified information. The requirements of this Section involve interface with a number of security-related Government entities. These entities are coordinated through the Overseas Buildings Operations (OBO) Project Director/Contracting Officer's Representative (COR) in coordination with the Regional Security Officer (RSO). The requirements include, but are not limited to:

1. General security procedures.
2. Information security.
3. Personnel procedures.
4. Labor requirements for specific activities.
5. Site access procedures.
6. Inspections by the Government.
7. Miscellaneous security requirements.
8. Prohibited and restricted items and activities.
9. Construction Security Technical Equipment (CSTE)

1.02 RELATED DOCUMENTS

A. Other General provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

1.03 DEFINITIONS

A. Refer to Chapter 2 of the OBO International Codes Supplement (OBO-ICS), IBC for definitions of all Contract-related terms and specifically, General Construction, Finish Work, General Work Area (GWA), Public Access Area.
B. For all terms not understood, request immediate clarification.

1.04 PERFORMANCE REQUIREMENTS:

A. The Contractor shall comply with the Government's requirements for participating in the Project security procedures as specified in this and subsequent Contract Sections, Public Law #100-204 (as amended). The Contractor shall also comply with requirements requested subsequent to issuance of the Notice to Proceed (NTP). The Contractor shall afford unrestricted access to work, allow surveillance and inspection by any Government personnel as authorized by the Project Director/COR, and perform required security work when directed by Project Director/COR. The Contractor shall maintain security, avoid the compromise of project information caused by unauthorized disclosures, and obtain appropriate security checks.

B. As noted in the Prohibited Countries List Matrix below, the following restrictions apply:

1. Citizens/Firms from the countries listed will not be allowed or used on this Project in any capacity.
2. Non-US or US firms owned or operated by citizens/firms from the countries listed will not be allowed or used on this Project in any capacity.

Prohibited Countries List Matrix	
Country	**Citizens/Firms**
Belarus	No
Cuba	No
Iran	No
North Korea	No
Peoples Republic of China	No
Russia	No
Venezuela	No
Vietnam	No

General Policy: The use of host country workers from or within the countries listed is permitted for projects in that country. Refer to the FAR for additional information concerning prohibited countries.
List Revised: October 25, 2013

C. The Department of State (DOS) reserves the right, in its sole discretion, to determine suitability of Contractor personnel at the Project Site or otherwise involved in work related to this Project.

1.05 SUBMITTALS

A. Submit the following:
1. Visitor Authorization and Contractor Country Clearances Requests, IAW Contract Section H.5.2.

PART 2 PRODUCTS

2.01 CONSTRUCTION SECURITY TECHNICAL EQUIPMENT (CSTE)

A. The Contractor shall be responsible for the procurement and maintenance of the CSTE specified in Attachment B. The Contractor shall provide additional consumable supplies, as specified in Attachment B.

PART 3 EXECUTION

3.01 GENERAL SECURITY PROCEDURES

A. All security requirements of the Contractor shall apply to all personnel on the project site (to include sub-contractor personnel).

3.02 INFORMATION SECURITY

A. Project Information Handling: See Contract Section H.5, Diplomatic Security Requirements for Clearances and Handling Classified, SBU and Unclassified Project Information

3.03 PERSONNEL PROCEDURES

A. Uncleared Personnel: Use of uncleared persons is limited to the areas and tasks described in Section 3.04.

1. Uncleared Labor: Uncleared labor will submit to a background investigation and obtain approval of the Project Director/COR before access is granted to Project Site or applicable Support Sites. The Contractor shall submit an Employment Application form, approved by the Site Security Coordinator (SSC) in consultation with the RSO, in sufficient time to permit processing prior to the anticipated date of employment. The estimated investigation processing time is 30 days. Uncleared labor is not authorized on the project site prior to a favorably adjudicated background investigation. If the background investigations have exceeded 30 days, the Contractor can provide a priority list with justification of workers needed and the Project Director/COR may approve temporary I.D. badges for temporary uncleared labor.
2. The Project Director/COR and RSO reserve the right to allow or deny access of persons and firms proposed to perform work or be present at the Project Site.
3. The RSO must approve Site access for temporary uncleared labor if the Site includes an operating Embassy or Consulate.

B. Uncleared Local/Third Country National Subcontractors: Contractor selection of host and third country national subcontractors must be approved by PD/RSO. See Contract Section H.6.16 for requirements.

C. U.S. Citizens without clearances: When the contractor wishes to assign U.S. citizens at the project site who do not possess security clearances, the contractor shall meet the requirements of Contract Section H.36.3.1. U.S. citizens with unfavorable National Criminal Indices Checks (NCICs) may not be allowed access to the site, subject to determination of PD/SSM.

D. Special DS Investigation: As determined by the Government's security managers, and as requested through the Project Director/COR, the Contractor shall accommodate additional special investigations as required for foreign nationals and certain categories of other personnel.

E. All U.S. citizen Contractor employees are required to adhere to reporting requirements IAW Contract Section H.5.15, as well as any adverse information relating to firms or individual personnel which reflects unfavorably on the trustworthiness or reliability of the firm or individual, suggests that the firm or individual's ability to safeguard classified information may be impaired, or that firm or individual may be subject to exploitation.

F. Briefings: The Government reserves the right to conduct briefings and debriefings for all persons performing work. Required briefings and debriefings include, but are not limited to, the following:

1. Management personnel are required to attend special security briefings and debriefings concerning reporting requirements on unusual incidents, activities, or information related to Project security as directed by the PD or SSC.
2. Visitors to the Project Site will be required to attend an appropriate security briefing by the PD or SSC or other Post security management personnel.

3.04 SECURITY REQUIREMENTS AND LABOR FOR SPECIFIC ACTIVITIES

A. The shaded areas in the following table indicate the minimum labor requirements for specific activities

AREA/TASK	Uncleared Contractor Provided Labor	Uncleared Contractor Provided Labor under Surveillance by CSTs	Top Secret Cleared Government Provided Labor
a. All work in non-CAA			
b. Technical Security Systems			
1. Cable and conduit installation in systems interface cabinet rooms and MSG Posts			
2. Equipment installation and termination of systems in systems interface cabinet rooms and MSG Posts			

3.05 SITE ACCESS PROCEDURES

A. Access Control Facility (ACF): The Contractor shall use the existing Service Compound Access Control (SCAC) as the ACF for this project. This location shall be used for all personnel and vehicular screening. All project deliveries will be made through the existing compound service entrance.

B. All Project personnel will be issued the appropriate badge and must comply with all Site access control procedures. In addition to the personnel selection and clearance requirements of the preceding paragraphs in this Section, the following security provisions related to Project Site access operations and procedures must be followed.

C. Identification Badges: Upon approval of each completed Employment Application Form, the PD/SSC will issue a photo-bearing identification badge, coded to indicate access approval. All uncleared personnel, to include sub-contractor personnel, are required to leave their badges at the designated construction access point prior to leaving the Project Site. Badges will be

reissued each day in exchange for depositing, with the Local Guard Force (LGF), an official Government issued photo-bearing identity document or any other form of identification acceptable to the Project Director/COR and/or SSC. Badges and documents will be exchanged as the employee departs from the Project Site. Employees are required to display badges prominently when at the Project Site.

1. Project Director/COR may allow UNCLEARED U.S. citizens for whom the RSO has obtained favorable National Criminal Indices Checks (NCICs) to be badged for unescorted access to the Project Site.
2. Cleared U.S. citizen visitors identified in a current valid Country Clearance Request, and when authorized by the Project Director/COR to enter the Project Site, will be issued a “cleared visitor badge.”
3. U.S. citizen Visitors (not workers as listed in paragraph 2 above) without a security clearance, when authorized by the Project Director/COR to enter the Project Site, will be issued a “visitor badge” and must be continuously escorted by a cleared U.S. citizen sponsor until departure from the Project Site.
4. Employees are required to surrender identification badges when access to the Project Site is no longer authorized or needed, or upon demand of the Project Director/COR.
5. Continued loss of badges, or failure to comply with required surrender of badges, will, at the Project Director/COR’s discretion, result in denial of access to the Project Site for one working day, at no cost to the Government. Continued failure to comply may result in permanent denial of access to the Project Site, at no cost to the Government.

D. Search Procedures: The Government reserves the right to conduct searches of all personnel belongings at the point of entering and leaving the Project Site. All persons entering and leaving the Project Site will be required to pass through a walk-through-metal-detector (WTMD) or screened with a handheld metal detector.

E. Tool Storage: Tool lockers will be provided in a protected space inside the Project Site for the convenience of employees who elect to leave personal tools, devices, and protective gear at the Project Site and avoid daily gate security inspection procedures for these items.

F. After Duty Hours: No contractor personnel will be permitted access to the Site after normal duty hours without prior written authorization from the Project Director/COR. All contractor personnel seeking access to the Site after normal working hours will be required to sign in and out of an After Hours Log.

G. Vehicle Control: In general, parking of vehicles on the Project Site will not be permitted. The exception is tractors, cranes, and similar implements used directly in performance of work, delivery of materials and supplies, and removal of waste and surplus material. Prior to passing through the perimeter gate(s) vehicles and drivers will be subject to search and inspection.

1. Written authorization from the Project Director/COR must be obtained for official motorized vehicular construction implements to be parked on the Project Site. Violating vehicles will be towed off the Project Site at the Contractor's expense.
2. Deliveries and removal of material at the Project Site must occur during regular working hours. Forty-eight (48) hours advance notice of ANY delivery arrival times must be provided. Seven days advance notice of deliveries at times other than regular working hours must be provided. Delivery delays are at the Contractor's expense.
3. Parking of construction employee automobiles and similar transportation vehicles is prohibited on the Project Site. It is the Contractor's responsibility to arrange for suitable off-site parking for these vehicles.

H. Visitor Notification: The Project Director/COR must be notified in advance of proposed Contractor visits. Visitors will be authorized on a demonstrated need-to-know basis. The Project Director/COR will approve, disapprove, or qualify each Contractor request in advance of each visit. Contractor Country Clearance Request procedures are detailed in Contract Section H.6.2. If Contractor Country Clearance Request has not been received prior to arrival IAW H.6.2.2, visitors will be treated and escorted by their sponsor as if they are uncleared. In addition, the Project Director/COR may refuse access to the Site until a Contractor Country Clearance Request has been received.

I. Contractor uncleared visitors who have not submitted an OF-612 or other approved form, must be approved by the Project Director (COR) and must be escorted at all times by Contractor provided cleared escorts approved by the Project Director (COR) in consultation with the RSO. They shall not perform construction work without approval of the Project Director (COR).

3.06 INSPECTIONS BY THE GOVERNMENT

A. The Government reserves the unqualified and unlimited right at any time to conduct security-related inspections of the Contractor's work, material, equipment, personnel, and temporary facilities at the Project Site and any off-site support facilities, to include subcontractor offices. Contract Section H.5 requires the contractor to provide written notification to PD/RSO of any off-site locations at which project information will be stored.

1. In instances where authorized work must be disassembled, uncovered, or demolished then reassembled, recovered, or rebuilt to accommodate inspection in compliance with construction specifications and security requirements, resultant costs of such actions will be borne by the Government. The Contractor shall be responsible for resultant costs when inspected work is found to be non-compliant with Project specifications or where work was performed without Government authorization. The Government reserves the right to suspend operations where unauthorized work has been performed and where introduction or attempted introduction of unauthorized material has taken place.

2. Reported Violations: Where an indication, report, or observation of unauthorized access or performance of unauthorized work has occurred, the Government reserves the right to suspend operations and deny access until circumstance and work can be investigated, inspected, tested, and resolved. All costs of such stoppages and resolutions shall be borne by the Contractor, except when alleged violations, after investigation, are determined not to be in violation of security requirements.

B. The Project Director/COR will coordinate for various technical security inspections throughout the construction period. The Project Director/COR will coordinate all security inspections and technical security system installation teams.

3.07 MISCELLANEOUS SECURITY REQUIREMENTS

A. Control of Keys and Lock Combinations: Key and lock combination control is essential for Government Project security. Keys shall not be duplicated or removed from the Project Site and lock combinations shall not be divulged without specific written advanced authorization from the Project Director/COR or RSO. Such loss of control observed or suspected by the Project Director/COR or RSO, shall result in required lock changes at the Contractor's expense. Duplicate keys and lock combinations shall be provided to the Project Director/COR and RSO for the purpose of security inspections and emergency actions. Keys and combinations necessary for unrestricted access to all Project areas, on-site and off-site Contractor offices, storage units, and similar locations shall be provided to the SSC. The SSC will assume control of such duplicate keys and combinations.

B. Contract Section H.5.11 requires the Contractor to develop and submit to the PD a waste paper disposal/destruction plan for all paper documents and drawings generated at the site. Project Director/COR shall coordinate approval and inspection of destruction methods as appropriate.

C. Contract Section H.5 details the requirements for information and computer security in site-offices and for any electronic media coming on to the site. Project Director/COR or RSO shall coordinate approval and inspection of information and computer security compliance as appropriate.

3.08 PROHIBITED AND RESTRICTED ITEMS AND ACTIVITIES

A. Prohibited/Restricted Items and Activities on Project Site include, but are not limited to, the following:

1. Firearms and other weapons, except as specifically authorized by the Project Director/COR.
2. Electronic media devices, including radios, recorders, transmitters, receivers, cell phones, cell phones with camera, video or audio recording capabilities, laptop computers, personal digital assistants (PDAs), smart phones (i.e. BlackBerrys, iPhones, etc.), media storage devices (i.e. thumb drives, jump drives, flash drives), and similar

items, except for authorized uses as approved by the Project Director/COR, in accordance with site procedural documentation, and as allowed by Contract Section H.

3. Drugs, including narcotics, barbiturates, marijuana, alcoholic beverages, and similar substances, except for use with a valid medical prescription.
4. Explosives, except for use in specifically limited amounts and under controlled circumstances for work specified to be performed through use of explosives. Such use requires written prior authorization from the Project Director/COR. As a hazardous material, the Contractor shall treat the use of explosives in accordance with guidance provided under Section 013525, Construction Safety and Occupational Health.
5. Cameras, except in accordance with 3.08.B below.

B. Photography

1. General: The use of photographic equipment and taking of photographs is restricted on and nearby the Project Site, as determined by the Project Director/COR. Written requests for approval of photography must be submitted well in advance of time intended for such activity, stating reasons, uses and disposition of imaging media. The Project Director/COR must review photographs and imaging media prior to removal from the site. The Government reserves the right to deny such use and release and limit to authorized purposes and distribution IAW Contract Section H.

3.09 SUPPLEMENTS

A. The Supplements listed below, following “End of Section,” are a part of this Specification:

1. Attachment A - Department of State (DOS) Security Personnel (By U.S. GOVERNMENT).
2. Attachment B – CSTE Approved Equipment List.

END OF SECTION

SECTION 013550
CONSTRUCTION SECURITY
ATTACHMENT A – DEPARTMENT OF STATE (DOS) SECURITY PERSONNEL (BY U.S. GOVERNMENT)

1.01 INTRODUCTION

The information provided below complements, but does not replace, information provided in Chapter 2 of the OBO International Codes Supplement (OBO-ICS) IBC. Aside from the Project Director/COR, who is ultimately responsible for ensuring that construction activities are accomplished in a manner that complies fully with applicable statues and security regulations, the following types of Government security personnel may be further assigned at the Construction Site to support this Project:

A. REGIONAL SECURITY OFFICER (RSO)

The RSO is the senior security officer for the Post. The RSO provides liaison with local authorities for security outside the Construction Site. If required, the RSO will conduct records checks and appropriate investigations on any local nationals and firms associated with the Project.

B. SITE SECURITY COORDINATOR (SSC)

The SSC is the designated Government representative responsible to the Project Director/COR for all construction security related issues at or on Site and is responsible for all Government security planning and Site security matters. The SSC will be at Post upon mobilization or at start of construction. Specifically, the SSC ensures security concerns are fully integrated with the overall construction plan and that security programs keep pace with the construction effort.

C. CONSTRUCTION SURVEILLANCE TECHNICIANS (CSTs).

CSTs are Top Secret cleared U.S. citizens experienced in related construction technology and professionally trained in Government surveillance techniques. CSTs are assigned to the Project to protect the security integrity of the CAA, CAA building materials, furniture, fixtures, and other CAA items. CSTs will observe work at the Project Site performed by uncleared Contractor personnel in CAA areas, areas contiguous to the CAA, and other areas as directed by the SSM in coordination with the Project Director/COR. CSTs will begin and end surveillance coverage upon determination by the Project Director/COR or SSM.

D. LOCAL GUARD FORCE (LGF)

Local Guards, as approved by the RSO and/or the SSC, may be used at the perimeter and other locations at the construction Site and may be provided through existing Post local guard contracts. The RSO is responsible for the acquisition, supervision, and qualifications of Local Guard Services.

E. LOCAL POLICE

As appropriate, the SSC, in coordination with the RSO, may request an enhanced presence near the perimeter of the Site by local police throughout the construction period.

F. MARINE SECURITY GUARDS (MSGs)

If the Construction Site is also the existing Chancery Site under 24-hour MSG control, CAGs may not be required to control access to the Site, work areas, or the SSA, provided the existing MSG Post resources are sufficient to accomplish the security requirements for the duration of the Project.

NOTE: This Project may or may not require all categories of security personnel.

END OF ATTACHMENT A

SECTION 013550
CONSTRUCTION SECURITY
ATTACHMENT B – CONSTRUCTION SECURITY TECHNICAL EQUIPMENT (CSTE)

PART 1 GENERAL

1.01 SUMMARY

This Addendum provides general design and installation criteria for the CSTE for this Project, system specification details and typical quantity requirements.

PART 2 CONSTRUCTION SECURITY TECHNICAL EQUIPMENT (CSTE)

2.01 ACCESS SCREENING SYSTEMS

The following systems, as specified in Part 3, are required for employee and visitor access screening prior to entering the Compound.

A. Explosives Detection:

1. The Contractor shall use the existing contraband detection and identification systems at the Site vehicle access point.

2. The Contractor shall provide consumable supplies for the duration of the construction project

B. Metal Detection: The Contractor shall furnish handheld metal detectors for supplemental screening.

A. Vehicle Inspection: The Contractor shall furnish vehicle underbody inspection mirrors for each Site vehicle access point.

2.02 PERSONNEL IDENTIFICATION SYSTEMS

The following systems, as specified in Part 3, are required for the identification of employees and visitors:

A. ID Badge System:

1. The contractor shall coordinate use of an existing badge machine at Post with the SSC.
2. The Contractor shall provide consumable supplies for the duration of the construction project.

2.03 LOCKING DEVICES

The Contractor shall provide, as specified in Part 3, locks and accessories required to secure various doors, gates, and containers

PART 3 CSTE APPROVED EQUIPMENT LIST

DS Number	Model Number	Description	Minimum Quantity
Actual CSTE requirements and quantities may vary based on specific project needs.			
1. ACCESS SCREENING SYSTEMS			
A. Explosion Detection			
DET646	K0001020-001B	Consumables Kit, Hazmat, for Itemiser 3	1
B. Metal Detection (ACF, NOB)			
	5350	Garrett Super Scanner Handheld Metal Detector	3
		9-volt alkaline batteries (box of 12)	3
C. Vehicle inspection (ACF)			
	1389	Omark Safety 12” Vehicle Inspection Mirror	4
2. PERSONNEL IDENTIFICATION SYSTEMS			
A. ID Badges (ACF)			
	JP-SD11X1	Jetpack Dual-Core (Ref: C25-JPDC1, REF: GOLDGUARD, REF: C-19-CONSECNB) Colors: Green (500)	500
	F85-52VSPWP	2-5/16”X3-1/2: Vertical Slot Pin Laminating Pouches	500
	NC-30	Bead Chain 30” Necklaces	500
	505-SD	Removable 2-3/4” Vinyl Strap Clips	500
	F10-R800INKSET	Ink Cartridge Set	4
		Rack to include individual slots for the storage of each workers ID badge (may be site fabricated)	1
***Notes: (**1) Specified quantities of consumable items are an estimate of project needs. (2) Additional consumable items, if required, shall be provided by the contractor. (3) System/supplies are available from: Identicard, 40 Citation Lane, P.O. Box 5349, Lancaster, PA 17606-5349, 800-223-0298, www.identicard.com.*			
3. LOCKING DEVICES			
	0883	Sargent and Greenleaf Environmental Padlock	2
	8077A	Sargent and Greenleaf Padlock with changeable combination	2
		Security Chain, Hardened Steel, Heavy Duty, 6 foot length to fit 0883 and 50-T032115KDP locks	2
***Note:** (1) Each key locking device should be keyed differently. (2) Provide three keys for each lock.*			

END OF ATTACHMENT B

SECTION 014010

CONTRACTOR QUALITY CONTROL

Part 1 General

1.01 Quality Control

A. The Quality Control system used during the project construction phase must ensure that the facility meets the contract design, quality and functional standards. To this end the Contractor is required to establish, implement and maintain an effective Construction Quality Control (CQC) Plan. The CQC Plan shall cover all constructions operations both onsite and offsite, and shall be keyed to the proposed construction sequence (definable features of work).

B. The Construction Quality Control Plan shall include, as a minimum, all quality processes performed by the contractor, subcontractors, fabricators, suppliers, and purchasing agents. ISO 9001:2008 shall be used as a base line for developing the control processes identified in Part 3 (Execution) of this specification.

C. The Contractor is responsible for quality control and shall establish and maintain an effective quality control system. The quality control system shall be defined by the CQC Plan, which defines the Contractor's quality policy, lines of authority and responsibility, QC personnel qualifications, and the procedures and organization necessary to produce a finished product that complies with the contract requirements.

D. The project manager and superintendents will be held accountable for the quality of work and are subject to removal at the direction of the PD/COR for failure to comply with quality requirements specified in the contract. The Contractor's project manager and superintendents in this context shall mean the individuals with responsibility for the overall supervision of field activities for the project.

E. The Government will schedule performance audits during the construction phase to assess the Contractor's performance against contract requirements and CQC Plan implementation. The Project Director/COR shall use the audit results to evaluate the completed work and progress made against the contract documents and project schedule when reviewing Contractor requests for progress payments.

1.02 Referenced/Related Documents: The publications listed below are incorporated into the specification by reference:

A. American Society for Testing and Materials (ASTM) ASTM D 3740 (Latest edition as of contract award date) Minimum requirements for agencies engaged in the testing and/or inspection of soils and rock as used in engineering design and construction.

B. ASTM E 329 (Latest edition as of contract award date) Agencies engaged in the testing and/or inspection of materials used in construction.

C. ISO 9001:2008 Quality Management Systems requirements is a quality program document that the contractor shall use to develop quality control processes for the CQC Plan.

1.03 Submittals: The Contractor shall submit, in accordance with Section 013305, (Construction Submittals) the following:

A. Contractor's Quality Control Plan (CQC Plan): The CQC Plan shall be submitted within thirty (30) calendar days after Contract Award. No work shall be undertaken before CQC Plan acceptance.

B. The name, qualifications (in resume format), duties, responsibilities and authorities of each person assigned to a Quality Control (QC) function shall be submitted to the Government for review. The Government will reject personnel who are not qualified for the positions for which they have been proposed. Changes to QC organization staffing shall only be made after acceptance by the Government of the proposed changes.

C. The Contract shall submit a Quality Control Report (QCR) to the Government daily. Reporting shall begin on the first day the contractor's forces arrive on site and shall continue until the contractor's forces have completely demobilized. Daily reports shall be submitted by 8:00 the following morning and shall include, at a minimum, the information discussed in this section. The report format shall be accepted by the Government prior to use. A sample QCR is attached to this Section.

D. The Contractor shall submit copies of audits and surveys of testing agency qualifications, which should include both personnel and equipment certifications.

E. Other contract provisions and attachments, including those provided by reference and amendment, apply to the requirements of this section. This Section in turn applies to the Contract Drawings and to Specification Divisions 2 through 33.

1.04 Qualifications of Quality Control Personnel

A. The Contractor Quality Control (CQC) Manager shall have a bachelor's Degree in Engineering, Architecture, Construction Management, or Quality Control and a minimum of 10 years experience implementing construction quality control programs for similar projects. The CQC Manager shall be on site at all times during construction, shall be employed directly by the prime contractor, and shall not be assigned any other duties. In the event the CQC Manager must be away from the site, the contractor shall provide a suitable substitute, acceptable to the Government, who is familiar with the project and the QC program. The QC Manager shall report to the Contractor's home office management team and not to the Project Manager on site. His autonomy in managing and enforcing the quality control program is critical and shall be reviewed and tested periodically by the Government.

B. QC Inspection and Testing personnel shall be qualified in accordance with the following:
   1. Current certifications as determined by the individuals employment specialties from National or International standards organizations (AWS, ICBO, ASME, IEEE,ISO, ACI, AWWA, etc.) or a college degree in engineering or architecture that is relevant to the individuals' employment specialty. In addition, experience shall include a minimum of 8 years implementing construction quality control programs for similar projects, or.
   2. High School education with 15 years construction experience and successful completion of a company or union sponsored training program in the discipline to be inspected. In addition, experience shall include a minimum of 10 years as a tradesman including 5 years in the performance of QC inspection activities.

1.05 Incidental Services

A. The contractor shall provide incidental services by engaged QC agencies, laboratories, and consultants, and shall accommodate services performed by the Government directly or by vendors engaged by the Government. Incidental services include, but are not limited to:

   1. Material testing;
   2. Assistance in gaining access to the works, in obtaining test samples, and in the subsequent repair of work and substrates where requested by the QC agency;
   3. Temporary facilities to be utilized for testing services;
   4. Handling, curing, storing and protecting test samples at the Project site.

Part 2 Products (not used)

Part 3 Execution

3.01 Content of the Construction Quality Control Plan.

A. The CQC Plan shall include, at a minimum, all work processes performed by the contractor, subcontractors, fabricators, suppliers, and purchasing agents.
   1. A description of the quality control organization, including a chart showing lines of authority and acknowledgement that the CQC staff will implement the three phase approach to construction quality control as described within.
   2. The name, qualifications (in resume format), duties, responsibilities and authority of each person assigned a CQC function.
   3. A copy of a letter, signed by the same official of the firm who signed the contract, which describes the responsibilities of the CQC Manager and delegates sufficient authorities to him to ensure he can implement the CQC plan effectively. The CQC Manager shall have the authority to stop the installation of work that does not comply with the contract and construction documents.
   4. Procedures for scheduling, reviewing, certifying and managing submittals, including those of subcontractors, offsite fabricators, suppliers and purchasing agents. The CQC Manager shall be responsible for certifying that all submittals are in compliance with the contract requirements.

5. Procedures to control, verify, accept, and document each specific test required to be performed in the specification. The Contractor shall provide a written report of each CQC Plan inspection and test performed. The report shall include the following as a minimum:
   a. Project title and project number.
   b. Inspection/test title, contract reference, and sequence number.
   c. Dates and locations of inspections, dates of inspections/tests, and the related contract specification section number.
   d. Recognized industry test methods and specifications. List all testing equipment used with serial numbers.
   e. Name of testing laboratory and the individual conducting the inspection or test.
   f. Ambient conditions at the time of sample-taking and inspection or test.
   g. Inspection and test data, results, interpretations, and analysis of information developed.
   h. Agency or individual comments and professional opinions concerning test compliance, whether work complies with requirements, and whether retesting or other testing is recommended. These comments and opinions shall bear the responsible individual's signature.
   i. Other data as required or implied by the nature of a particular inspection or test or by provisions in related technical sections of the contract specifications or drawing notes.
   j. Where applicable, the Contractor shall include a statement (Certificate of Compliance) of the agency or individual conducting the inspection or test, certifying that the materials, equipment, or services comply with the requirements of the Contract. This statement shall include any observed or determined reservations in certifying such materials, equipment, or services.
6. Procedure for tracking preparatory, initial, and follow-up control phases of each definable feature of work.
7. A procedure for inspection of work and materials, including receiving inspections and control of materials staged for construction on site.
8. A corrective action procedure for identifying and controlling construction deficiencies from identification through corrective action and acceptance.
9. Document control and reporting procedures, including format.
10. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be performed by different trades or disciplines. Although each specification section may generally be considered a definable feature of work, there are frequently more than one definable feature under a particular section. This list shall be included and submitted as the index to the CQC Plan.
11. Procedures to control and document design changes shall be included in the CQC Plan. All design changes shall be submitted to and accepted by the Government. A complete set of drawings used in the As-Built (red line) process will be controlled on site by the CQC Manager. All red line changes to the design shall be accepted by the Government. Red line changes shall be initialed by the CQC Manager and the Project Director/COR or his designated representative.
12. Logs of test equipment calibrations.

3.02 Quality Control Meetings

A. Prior to starting site work, the Contractor shall schedule a coordination meeting with the Government and discuss the CQC Plan. During the meeting, a mutual understanding of the plan details shall be developed, including the forms for recording the CQC inspections, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of the Contractor's management and control with the Government. Meeting minutes shall be prepared by the Contractor and signed by both the Contractor and the Government and the minutes shall become a part of the contract record. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the Contractor.

B. All timeframes identified in the CQC Plan, for onsite and offsite activities, including interrelationships between CQC Plan actions and the Government's related actions, will be reviewed for acceptance by the Government.

C. After start of construction, the Contractor's CQC Manager shall conduct weekly CQC meetings at the Project Site with key Contractor staff, including the Project Manager, superintendents, and other QC staff.

D. The Contractor shall notify the Government, who may elect to attend or send representatives, at least 48 hours in advance of weekly QC meetings.

E. At a minimum, the following topics shall be discussed and documented at QC meetings:

1. Status of all on-going quality-related matters.
2. Deficiencies identified or rectified since previous meetings.
3. Work planned for the following two weeks and supporting QC actions.
4. Construction methods and approaches for quality construction on upcoming work items.
5. The Contractor shall prepare and distribute detailed minutes of all CQC meetings for signature by the Contractor's Project Manager and the Project Director/COR.

3.03 Three Phase Approach to Quality Control

A. The three phases of control shall be conducted by the CQC Manager for each definable feature of work as follows:

1. Preparatory Phase: This phase shall be performed prior to beginning work on each definable feature of work; after all required plans, documents, materials are accepted. A preparatory meeting shall be called by the CQC Manager to demonstrate that the Contractor has all the necessary materials, equipment and personnel to start a definable feature of work. Agenda items shall include:
   a. Review of the applicable specifications.
   b. Review of the contract drawings.

c. Confirmation that all materials and/or equipment have been tested and submittals have been received and accepted.
d. Review of provisions that have been made to provide required control inspection and testing.
e. Examination of the work area to ensure that all required preliminary work has been completed and is in compliance with the contract.
f. Physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to accepted shop drawings or submitted data, and are properly stored.
g. Review of the applicable safety requirements to ensure they are met.
h. Discussion of procedures for controlling quality of the work, including repetitive deficiencies.
i. Discussion and scheduling for the initial control phase.
j. The Contractor will provide to the Project Director/COR the agenda 48 hours in advance of the preparatory control meeting. This meeting shall be conducted by the CQC Manager and attended by the superintendent and foremen responsible for the definable feature of work and other CQC personnel as applicable. The results of the preparatory phase activities shall be documented by separate minutes prepared by the CQC Manager and attached to the daily CQC report. The responsible superintendent and foremen shall instruct applicable craftsmen as to the acceptable level of workmanship required by the contract specifications.

2. Initial Phase: This phase shall be accomplished at the beginning of field construction of a definable feature of work. This phase shall be held at the work site with a demonstration of how the work is to be performed in order to meet the contract requirements. If mock-ups are required for a definable feature of work, they shall have been completed far enough in advance of the Initial Phase that all materials shall have hardened or dried and shall be in such condition as the finished product will achieve at completion. Agenda items shall include:
   a. Review the work to ensure that it is in full compliance with contract requirements as discussed in the Preparatory Phase meeting. The minutes of the preparatory meeting shall be reviewed as necessary.
   b. Verify the adequacy of controls to ensure full contract compliance. Verify required control inspections and testing.
   c. Establish the level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required samples and mock-ups as appropriate.
   d. Resolve all differences.
   e. Review safety requirements to include compliance with and possible revision of the safety plan and activity hazard analysis. Review the activity hazard analysis with all workers. Ensure that the safety control barriers and/or signs have been correctly installed.
   f. The initial phase should be repeated anytime a new crew begins work on a definable feature of work or any time acceptable quality standards are not being met.
   g. The Contractor will provide the agenda to the Project Director/COR at least 48 hours in advance of beginning the initial phase. Separate minutes for this phase shall be prepared by the CQC Manager and

attached to the daily CQC report. The exact location of the initial phase shall be indicated for future reference and comparison with follow-up phases.

3. Follow-up Phase
Daily checks shall be performed to ensure that control activities, including control testing, are providing continued compliance with contract requirements until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to starting additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal deficient work.

B. Completion Inspection

1. Punch-List Inspection:
At completion of all work or any increment thereof, the contractor shall conduct joint inspections of the work with the government. The contractor shall record all deficiencies and work identified as not conforming to the plans and specifications, and a list of the findings, by location, shall be submitted to the Government within two days after each joint inspection. The list of these findings shall constitute the punch-list. At completion of all punch-list work or any increment thereof, the contractor shall conduct a joint re-inspection with the Government to verify completion of the punch-list work. Both the contractor and the Government shall confirm mutual agreement of completion by signing the punch-list and indicating that each item on the punch-list is complete. The contractor shall submit two hardcopies of the signed punch-list and an electronic copy of the signed list in xxx.pdf format.

2. Final Acceptance Inspection
No later than six (6) weeks after substantial completion the contractor shall conduct the joint, final acceptance inspection with the Government. The contractor shall provide a minimum of 14-days advance written notice to the Government and certify the work shall be complete prior to commencing the final acceptance inspection.

During the joint, final acceptance inspection the contractor shall record all deficiencies and all work identified as not conforming to the plans and specifications. A list of the findings, by location, shall be submitted to the Government within two days after the inspection. The list of these findings shall constitute the list of final acceptance defects. The contractor shall immediately complete all work on the list of final acceptance defects. At completion of all items on the list of final acceptance defects, the contractor shall conduct a joint re-inspection with the Government to verify completion. Both the contractor and the Government shall confirm mutual agreement of completion by signing the list of final acceptance defects and indicating that each item is complete. The contractor shall submit two hardcopies of the signed list of final

acceptance defects and an electronic copy of the signed list in xxx.pdf format.

3.04 Daily Reporting

A. The Contractor shall provide CQC Daily Reports that provide factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:
   1. Contractor/subcontractor and their area of responsibility.
   2. Work performed each day, giving location, description, and by whom performed. Work conducted on building structures shall be located by column line.
   3. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified Preparatory, Initial, or Follow-up.
   4. List deficiencies noted along with corrective action.
   5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to contract specifications and drawings. Documents used to certify materials and equipment should be traceable to the material or equipment by a unique identification number i.e. heat number, serial number, etc.
   6. Submittals reviewed, with contract reference, by whom reviewed, and action taken.
   7. Off-site surveillance activities, including actions taken.
   8. Job safety evaluations stating what was checked, results, and instructions or corrective actions taken.
   9. Instructions given/received and conflicts in plans and/or Specifications.
   10. The CQC Daily Report shall indicate a description of trades working on the project and where; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily by 8:00am the following day. Reports shall be submitted for days on which no work was performed. Attached to the daily reports shall be copies of test reports, inspection reports, and reports prepared by subordinate quality control personnel.

3.05 RESTORATION AND PROTECTION

A. Restoration: Upon completion of inspections, sampling, testing, and correction of defects, the Contractor shall repair damaged work and substrates and restore finishes to eliminate deficiencies in visual and performance qualities. This restoration shall be in compliance with the Contract Documents.
B. Continued Protection: Continued protection of completed work shall be provided throughout the construction period and protective measures shall be monitored in relation to construction activity.

3.06 Records

A. The Contractor shall maintain a complete record of CQC Plan actions, ready for Governments examination at any time. Defects, deficiencies, and non-compliance shall be highlighted along with corrective actions and any reconstruction completed, to be completed, or recommended for acceptance by the Government.

END OF SECTION

SECTION 015005
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies minimum requirements associated with certain temporary facilities and controls, recognized as necessary for the performance of work. This Section is in no way intended to limit the general requirement to reasonably and properly provide required temporary facilities for the performance of work.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

B. Regulations and Standards: Work performed at the Project Site related to power distribution and electricity shall comply with the requirements of the OBO Electrical Code (National Fire Protection Association (NFPA) 70), National Electrical Code, as amended by OBO.

1.03 SUBMITTALS

A. The Contractor shall submit, in accordance with Section 013305, *Construction Submittals*, the following:

B. The Contractor shall provide a Site Utililization Plan for the temporary facilities to include drawings, plans, details, and schedules. The Contractor shall also comply with the requirements of Sections 015015 Temporary Security Facilities and Controls and 013525 *Construction Safety and Occupational Health*.

1. The Contractor shall submit the Site Utilization Plan with 30 days after the initial Notice to Proceed.
2. The Contractor shall obtain Project Director/COR acceptance prior to proceeding with the construction of facilities.
3. The Contractor shall provide a proposed layout of Project signage, outlining paint, application of wording, and other graphic requirements. The Contractor shall obtain Director/COR acceptance prior to fabrication and erection.
4. Temporary Electrical and Lighting Plan: The Contractor shall provide a sketch of the proposed temporary power distribution systems to the Project Director/COR. Temporary power shall not be installed until acceptance is obtained.

5. The Contractor shall perform continuous analysis of non-potable construction water composition, ensuring ongoing suitability for construction purposes.

1.04 HOST COUNTRY REGULATIONS

A. The Contractor shall comply with the Host Country's governing regulations as enforced by their authorities. These include building codes, requirements of utility companies, health and safety regulations by police, rescue, and fire departments, environmental protection regulations, and other applicable regulations. Any conflict between direction by the Host Country authorities and contract requirements shall be brought to the attention of the PD/COR for resolution.

B. Inspections: The Contractor shall arrange for required inspections, certifications, and permits. These inspections shall apply to the installation and use of each temporary facility as required by governing authorities and franchised service vendors.

1.05 PROJECT CONDITIONS

A. The Contractor shall take into consideration the existing and developing conditions for the implementation, maintenance, and continuation of temporary facility service at the Project Site. The Contractor shall submit recommendations to Project Director/COR regarding when, whether, and to what extent conversion from temporary to permanent use of the Project's facilities and services is appropriate and acceptable.

B. The Contractor shall maintain temporary facilities in clean, sanitary, and safe operating condition. The Contractor shall not allow conditions of use to become inefficient, overloaded, hazardous, or otherwise deleterious to the Government's interests.

C. The Contractor shall locate and relocate temporary facilities as necessary to accommodate proper performance of the work, including work by separate contractors and the Government. The Contractor shall remove temporary facilities as soon as use is no longer required and restore substrates and environments to required conditions.

PART 2 PRODUCTS

A. The Contractor shall provide new materials and equipment for temporary facilities. Where applicable, the Contractor shall comply with related requirements for permanent work of this project.

PART 3 EXECUTION

3.01 TEMPORARY UTILITIES

A. General:

1. Prior to completion of temporary utility services and distributions, the Contractor shall provide trucked-in and trucked-out services, where possible, for work in progress.
2. The Contractor shall connect to existing franchised utilities for required services, where reasonably possible.
3. The Contractor shall engage franchised vendors, where possible, to install services at locations agreed to by the Project Director/COR.
4. Except as otherwise indicated, the Contractor shall provide temporary connections to existing utilities, using permanent forms of construction. The Contractor shall comply with the requirements of franchised providers and operators of such utilities.
5. Permanent Utilities and Services: At the earliest reasonable date, and as agreed to by the Project Director/COR, the Contractor shall connect with permanent utility lines and service connections and remove temporary utilities and services.
6. The Contractor shall pay all installation, connection, usage, and disconnect fees as required by franchised utilities.
7. The Contractor shall obtain easements as may be necessary to extend permanent or temporary utilities to the Project Site. The Contractor shall survey the needs of the entire Project during construction, including work by separate contractors and the Government, and arrange for sufficient utility capacities.

B. Temporary Water:

1. Potable Water: Refer to Section 013525, *Construction Safety and Occupational Health*.
2. Non-Potable Water for Construction Use:
   a. Where non-potable water is provided and distributed at the Project Site, the Contractor shall furnish a continuing analysis of water composition, confirming its continuing suitability for construction purposes (not including human consumption). The Contractor shall test each load of trucked-in water.
   b. The Contractor shall post "NOT FOR DRINKING" signs at each water outlet and at other locations where non-potable water could possibly be accessed, including hose ends. The Contractor shall post signs in English, other applicable languages, and include a suitable pictographic.
   c. The Contractor shall provide adequate water capacity for fire protection.
   d. Distribution:
      1) The Contractor shall maintain not less than two hundred (200) -kPa static pressure.

2) The Contractor shall provide water to hose bibs at each story of construction and at other points of convenience within building construction area(s). Every location requiring the use of construction water must be reached with a maximum thirty (30) meter length.
3) The Contractor shall provide an adequate number of nineteen (19) millimeter diameter thirty (30) meter length heavy-duty rubber or vinyl hoses of with male and female connections.
4) Where applicable, the Contractor shall protect piped water distribution from freezing.

C. Sanitary Sewer: The Contractor shall provide the connection of temporary sanitary facilities to a sewerage system where reasonably possible. The use of septic tanks, cesspools, and similar methods for disposal of effluent shall not be permitted except by written authorization of the Project Director/COR.

D. Temporary Electricity:

1. The Contractor shall design, install, maintain, and remove locally franchised utility company electrical service and distribution systems. The Contractor shall comply with the requirements of NFPA 70, National Electrical Code.
2. Temporary Electrical and Lighting Plan: The Contractor shall indicate location, voltages, and means of circuit protection (including receptacles, disconnecting means, grounding, ground fault circuit interrupters, and lighting circuits).
3. The Contractor shall furnish and install new dry-type transformers, switches, spider boxes, panel boards, feeders, and other miscellaneous equipment as required for temporary facility and construction equipment service.
4. The Contractor shall provide an overload-protected, weatherproof, grounded, power distribution system. This system must be sufficient for an office's maximum predictable use of power tools, lighting, HVAC, test equipment, and the start-up of power driven equipment. This system must be compatible with the demands of permanent power distribution and similar temporary power systems. The Contractor shall locate receptacle outlets at points of convenience on each story of the building construction area and at designated fabrication areas and shops. These outlets shall be spaced enabling the reach of a single extension cord of not more than thirty (30) meters in length. The Contractor shall provide an automatic ground-fault interrupter feature on the temporary power distribution system.
5. The Contractor shall extend and modify the electrical system to serve the changing needs of the construction project.
6. Stand-by Power: The Contractor shall provide an engine-driven stand-by power generation system. The system shall include push button automatic or remote start capability located within control facilities at entrance gate. The system shall be sized for a continuous load of not less than fifty-five (55) kW.

7. The Contractor shall utilize the temporary power system to the maximum extent possible and reserve existing generators and fuel on the Project Site for emergency back up only.

E. Temporary Lighting:

1. The Contractor shall provide a combination of sufficient day lighting, general electrical lighting, and plug-in task lighting in every construction area to ensure the proper and adequate performance of work, reading of signs, inspection, testing, and other need-to-see requirements.
2. The Contractor shall provide local switching for each space and area of temporary lighting. This shall enable energy conservation by both a "turned off" and a "reduced level" mode of lighting.
3. The Contractor shall provide applicable high-efficiency fluorescent lighting fixtures and tubes.
4. The Contractor shall comply with the Project Director's/COR's requests for temporary lighting at every stage of project work.

F. Temporary Heating, Cooling, and Ventilating:

1. In conjunction with temporary enclosure of work, and where applicable, the Contractor shall provide temporary heating, cooling, drying, humidification, and similar ambient conditioning of space for the proper performance of work and the curing and protection of completed work.
2. The Contractor shall provide a safe energy source and equipment considered no more hazardous or dangerous than LPG-fired, UL-tested and accepted, temporary space heaters. The Contractor shall not use oil burners, salamanders, other open-burning units, or hazardous fuels.
3. The Contractor shall not position equipment deleteriously.
4. At the earliest feasible date, the Contractor shall utilize permanent systems and equipment for temporary service, as agreed upon by the Project Director/COR. The Contractor shall provide fully qualified and licensed operators and instigate protective measures to minimize possible damage to systems and equipment.

G. Temporary Telecommunications:

1. The Contractor shall provide pathways and wiring for phone and data communications between and within all Government facilities and to local service provider networks. The final locations will be confirmed by the Project Director after review of the temporary facility submittals and Site Plan.

H. Temporary Fire Protection: The Contractor shall comply with the requirements of Section 013525, *Construction Safety and Occupational Health*.

3.03 TEMPORARY CONSTRUCTION FACILITIES

A. GENERAL:

1. The Contractor is encouraged to utilize semi-permanent or portable facilities where possible in compliance with the requirements of this Section.
2. The Contractor shall comply with the latest version of the US Army Corps of Engineers, Safety and Health Requirements Manual EM385-1-1 with respect to all temporary facilities.
3. The Contractor shall provide temporary enclosures for weather and dust protection, security, visual, and acoustical separation, conservation of energy, comfort and efficiency of tradespersons, and effective separation of work by separate contractors and the Government.
4. The Contractor shall provide support facilities such as toilets, lunch rooms, drinking fountains, and similar facilities for all Site personnel (Refer to Section 013525, *Construction Safety and Occupational Health* for details).
5. The Contractor shall provide shops, sheds, storage spaces, and similar durable enclosures for use throughout the construction period.
6. The Contractor shall provide environmental control facilities, including exterior thermometers.
7. The Contractor shall provide temporary enclosures for the protection of fabricated, installed, or cured work from weather. The enclosures shall secure the Site from possible loss and restricted (classified) access and other reasons as indicated.
8. The Contractor shall provide separate storage for flammable and combustible liquids. Refer to the most updated edition of the US Army Corps of Engineers, Safety and Health Requirements Manual EM 385-1-1 for additional requirements and information.
9. Materials:
   a. The Contractor shall provide new materials of suitable grade for the intended purpose. Where applicable, the Contractor shall comply with related requirements for permanent work of this project.
   b. The Contractor shall provide UL-labeled tarpaulins with a flame-spread rating of fifteen (15) or less and translucent, nylon-reinforced, laminations of polyethylene or PVC films, with similar fire-retardant ratings.
   c. The Contractor shall provide UL-labeled, fire-treated lumber and plywood wherever wooden construction is not otherwise protected or covered to effectively reduce flammability. This shall apply to offices, tool sheds, storage rooms, scaffolds, walkways, fences, sidewalk bridges, other enclosures and barriers, and where contiguous wood exposure exceeds ten (10) square meters.
   d. Roofing: The Contractor shall provide either UL Class "A" standard weight asphalt shingles (ASTM D 3018) or UL Class "C"

mineral-surfaced roll roofing (ASTM D 249) on temporary offices, sheds, and enclosures.

e. Where appropriate, the Contractor shall provide a translucent-type enclosure to avoid the restriction of daylight.

B. U.S. Government Field Office:

1. Existing buildings or structures to be demolished under this Contract may not be used for the Government field office.
2. Refer to Attachment “A” Typical Government Temporary Office Space Requirement The Contractor shall design, provide, and install facilities equipped with suitable architectural finishes, doors, windows, hardware, fixtures, and accessories of not less than 125 square meters, which includes a 1.3 factor for circulation and configured as follows:
   a. Two (2) private offices of 15 square meters each , Receptionist area,
   b. Combination general office/plans room,
   c. Storage Space: Lockable and alarmed for securing files, Project documents, and equipment,
   f. Men's and women's toilet room,
   g. Utility and mechanical spaces,
   h. Incoming and outgoing telephone lines with instruments for all offices and office work areas,
   i. Infrastructure (e.g., cabling) for Government-provided computer and telephone systems. The Contractor shall provide 5’ x 5’ (minimum) room with 24/7 cooling and a solid core door to accommodate the Government’s data and telecom equipment. This door shall be locked (deadbolt and simplex) and alarmed.
   j. Lighting, convenience power outlets, HVAC, plumbing, fire protection, refrigerated drinking fountain, and kitchenette counter unit with sink and garbage disposal.
3. Field Office Workstation Cabling
   a. Provide (up to) 24 workstations (WAO) locations, at locations approved by the Project Director. Each WAO consists of (2) category 6 cables (one voice; one data). Voice & data cables shall be different colors. Terminate cables (T568A) with RJ-45 jacks at the workstations.
   b. In the server room, terminate data cable (T568A pin-out) with RJ-45 (8p8c) connector/plug. Terminate voice cable (T568A using orange & blue pairs) with RJ-11 (4p4c) connector/plug. Test/label each cable and faceplate at the workstation and cables in the server room.
   c. In the server room, route horizontal cables at ceiling height (in cable tray) to rear of server room and drop down wall to floor. At floor, provide additional 10’ slack to route cables into ½-high data cabinet. Segregate the voice and data cables into (2) groups/bundles and route to data cabinet location.
   d. Server room construction shall include floor to ceiling construction, dedicated cooling (3/4 -1 ton split-pack) and fluorescent lighting. Provide (2) duplex electrical outlets

(dedicated circuit) at rear of server room and (1) duplex electrical outlet at mid-room, one on each side, all at 15”AFF. Server room floor shall be painted. The server room shall not have windows. Dedicated electrical outlets ground shall measure less than 10 ohms.

4. The entry/exit doors and server room doors shall be either solid core wood or hollow metal doors.
5. The Contractor shall provide, design, and install temporary technical security systems (TSS) to include:
   a. Door contact on the entry/exit doors and server room doors,
   b. PIR motion detectors
7. Contractor-provided field office facilities shall remain the property of the Contractor.

C. Contractor's Field Office:

1. The Contractor shall provide field office space at the Project Site, equivalent in quality to that specified for the Government field office. This office shall include furnishings, fixtures and equipment, and be sized to accommodate the incidental field office needs of the supervision and administrative functions of the Contractor, subcontractors, suppliers, consultants, testing agencies, officials, separate contractors, and others engaged in Project work.
2. The entry/exit doors and server room doors shall be either solid core wood or hollow metal doors.
3. The Contractor shall provide, design, and install temporary technical security systems (TSS) to include:
   a. Door contact on the entry/exit doors and server room doors,
   b. PIR motion detectors
4. The field office, furniture and equipment shall remain the property of the Contractor.

3.04 TEMPORARY SERVICES

A. Temporary services provided at the Project Site by the Contractor shall include, but not limited to:

1. Waste collection and disposal services.
2. Janitorial services.
3. Rodent, Insect, and Pest Control Services (Refer to Section 013525, *Construction Safety and Occupational Health)*.
4. Removal of accumulated water, ice and snow

3.05 TEMPORARY SECURITY

A. The Contractor shall provide adequate temporary security and protective facilities for the prevention of property loss and disruption, destruction, and deterioration of the work. This includes tools, services, and facilities being utilized to perform the work. The Contractor shall provide protection against fire, unauthorized intrusion, vandalism, weathering, unauthorized access to

the Government's classified information or equipment, and the physical security of persons involved in the handling or protection of such information or equipment.

B. Required temporary security and protection of facilities and procedures includes, but is not be limited to, facilities necessary for compliance with the requirements of Section 013525, *Construction Safety and Occupational Health*.

C. Where temporary lockup for use by Government inspection teams and installation contractors is required for separately enclosed areas, the Contractor shall provide adequate temporary doors and hardware including locks. Key control will be under the direct supervision of the Site Security Manager (SSM) (Refer to Section 013550, *Construction Security* for key and lock combination control details). Where permanent doors and hardware can be used for temporary lockup purposes, the Contractor shall install temporary lock cylinders until complete control of access is transferred to the ultimate Government user, as directed by the Project Director/COR.

D. The Contractor shall post signage for the convenience and efficiency of tradespersons seeking access to locked areas.

E. The Contractor shall install temporary intrusion detection systems where necessary.

F. The Contractor shall coordinate the actions of the Contractor's watchmen with the Government’s security enforcement personnel and programs.

3.06 TEMPORARY CONTROLS

A. Surface Drainage:

1. The Contractor shall prevent silt, sediment, contaminates, and other products of the construction operation from entering sewer systems and off-site waterways.
2. The Contractor shall provide straw bales, erosion control fabric, silt fences, sediment ponds, and similar devices to clean up water runoff. All devices shall comply with local environment protection regulations.

B. Storm Water Protection:

1. The Contractor shall provide a system for controlling storm water and its removal from the Site as quickly as possible with a minimum of damage. The Contractor is responsible for protecting the work from storm water and rain damage and shall be responsible for all costs resulting from failure to provide adequate protection.

C. De-watering: The Contractor shall provide de-watering of excavations and elements of construction using well-pointing systems, pumping, and other

methods of removal. The Contractor shall remove accumulated water to preclude interference with the prosecution of the work.

3.07 TEMPORARY PROJECT IDENTIFICATION

A. Project Signage:

1. Upon mobilization to the Project Site, the Contractor shall consult with the Project Director/COR to determine if a two-sided sign is necessary and, if so, provide two identical project sign panels.
2. Within thirty (30) days of the LNTP-Construction, the Contractor shall construct and erect signage at the Project Site facing public access routes, as accepted by the Project Director/COR.
3. Signage shall meet the following minimum requirements:
   a. Sign Panel(s):
      1) The Contractor shall prepare sign panels on a sheet of primed-and-enameled grade plywood, not less than 2.4 meters x 1.2 meters x 19 millimeters thick or, if two-sided, 13 mm thick.
      2) The Contractor shall engage an experienced and qualified sign painter to apply the required graphics as shown in the attached Supplement.
      3) The Contractor shall develop a rendering of the New Office Building at the scale indicated and include as a graphic representation on each sign panel.
      4) Signage shall be in English and the language(s) of the host nation.
      5) Two-Sided: The Contractor shall trim all edges of 19 mm x 140-mm wood panel closure boards.
   b. Sign Mounting:
      1) The Contractor shall provide and mount signs on substantial supports (e.g., on two treated-wood posts, 89 x 140 millimeters x 3,000 mm long, set 1 meter into the ground, and 1.5 meters on center). The top of sign shall be flush with the top of posts (approximately 0.45 meters from each end).
      2) Two-Sided: The Contractor shall mount identical sign panels on opposite faces of support posts.
   c. Sign Illumination: The Contractor shall provide adequate temporary exterior grade electric lighting to illuminate sign panel(s).

B. Supplemental Signage:

1. The Contractor shall provide appropriate durable temporary signage within the Project Site as reasonably required for the effective and efficient guidance of persons and as requested by the Project Director/COR.
2. The Contractor shall prepare signage in English and the host country's language(s). This signage shall include supplemental international

pictorial graphics (pictographs), where appropriate, for information of persons unable to read provided text.

3. The Contractor shall provide a bulletin board for the posting of notices.

C. The Government reserves the right of ownership of Project identification signs and certain other elements of temporary signage.

3.08 TEMPORARY LABOR CAMPS (IF APPLICABLE)

A. Contractors and sub-contractors who make use of imported labor identified as Third Country Nationals (TCN's), to the Project site, shall be accountable and responsible to provide billeting and residential support that meets the U.S. Occupational Safety & Health Standards (OSHA) Temporary Labor Camp Standard -1910.142.

B. Contractors-sub-contractors shall provide the OBO/Project Director /COR with a "TCN Labor Plan" explaining how they, intend to manage and support quality living space of their TCN's. The Labor Plan shall include the names of the Camp Manager, the name and number of TCN's in residence, location of facilities, fire life safety apparatus and planning, medical support, and other information required by the OBO/Project Director.

3.09 REMOVAL OF TEMPORARY FACILITIES

A. As each temporary facility is no longer needed, and as agreed upon by the Project Director/COR, the Contractor shall remove said facilities from the Project Site. In general and where applicable, the Contractor shall remove temporary facilities as soon as permanent facilities have been completed and accepted.

B. Upon removal, the Contractor shall complete work impacted by the presence of temporary facilities. The Contractor shall restore substrates and sub-grade base courses, including areas to be paved or otherwise finished.

C. The Contractor shall comply with the Project Director's/COR's instructions regarding the manner of removal and disposition. This includes retention of certain elements as may be applicable for continued use by the Government.

D. The installation of furniture, fixtures, and equipment by separate contractors and by the Government may extend beyond Substantial Completion of this Contract and may require retention of certain temporary facilities. The Contractor shall coordinate with the Project Director/COR for removal of these facilities.

E. Government-supplied equipment, furniture, vehicles, devices, and materials will remain the property of the Government.

F. The Contractor shall remove the Contractor's field offices at Project completion or at a time mutually agreed upon should a portion of these spaces be required to service Project warranties. The Contractor shall

remove and dispose in accordance with this Section and Section 017705, *Closeout Procedures*, as applicable.

G. Restoration: After Substantial Completion and where permanent work has been used as a temporary facility, the Contractor shall restore to new-and-unused condition, following removal of temporary coverings, and similar provisions. The Contractor shall replace significantly worn parts and replace damaged elements and finishes. The Contractor shall comply with the following general renovations of work:

1. In heating, ventilating, and air conditioning (HVAC) systems, replace filters and clean the inside of ductwork and housings. At conclusion of temporary service, clean and replace fluids, filters, and other expendable and damaged parts. Generally restore the HVAC system to nearly new operating condition.
2. Replace lamps in light fixtures where indicated that substantial portion of useful life has expired. Prior to Substantial Completion, furnish to the Government with a stock of new replacement lamps. The quantity of this stock shall be the equivalent of the summation of used life spans of the fixtures operated as temporary facilities.
3. Coordinate with the Project Director/COR prior to sending notification to franchised utility and service companies regarding the date meter readings are to be converted to permanent service. This will mark the date after which billings for use and services become the responsibility of the Government. This date will occur after Substantial Completion and no later than occupancy.
4. If permanent NEC generators are used to temporarily provide power to the Site during construction, at the conclusion of temporary service, the Contractor shall clean and replace fluids, filters, and other expendable and damaged parts. The Contractor shall restore the generators to nearly new operating condition. If the construction load is below the manufacturer's recommended minimum for permanent generator use, a load bank shall be used to augment the construction load and ensure the permanent generators are not damaged.

H. Refer to Section 017705, *Closeout Procedures* for other required actions for the termination and disposition of temporary facilities.

3.10 SUPPLEMENTS

A. The Supplements, listed below, following “End of Section”, are a part of this Specification:

1. Government Office Space Requirement Plan Attachment “A”
2. Standard Project Sign. Attachment “B”

END OF SECTION

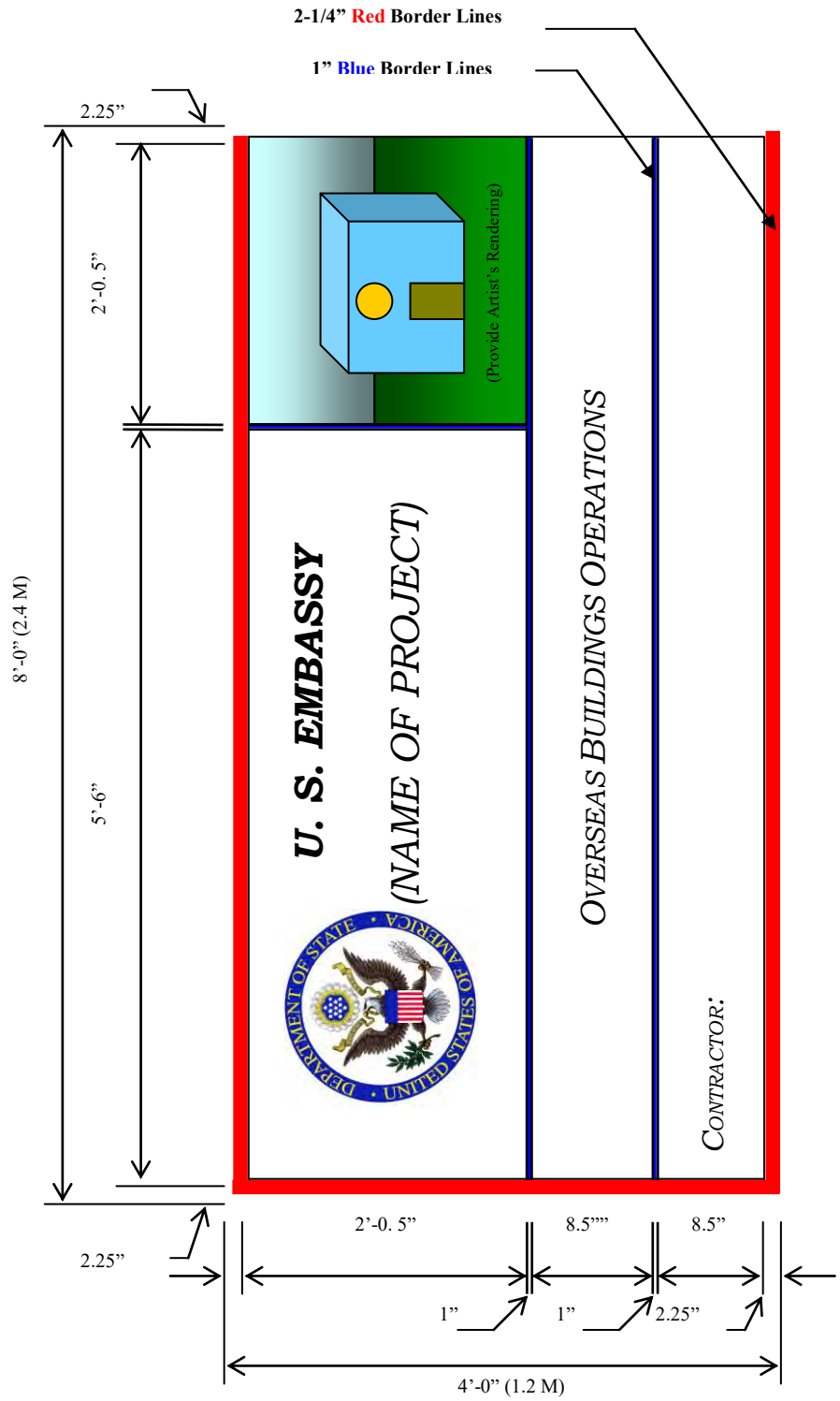
ATTACHMENT "A"
Typical Government Temporary Office
Space Requirement
(No. of Spaces Required May Vary)

	No. required	Area m^2 / unit	Total Area m^2	Furniture and Accessories in each unit		Tel/Com Requirements in each unit
Office	2	15	30	1 each Workstation (1 ea .75m x2.2m x .9m high table & 1 ea .6m x 1.6m x .9m high table & 1 each .6m x 1.0m x .9m high & 3-drawer pedestal on wheels	1 each standard office chair, 2 each stackable visitor chairs, 1 each 2-drawer file cabinet, 1 each 5-shelf bookcase	1 each telephone connection 2 each data connection
Reception Area	1	15	15	2 each Workstation (1 ea .75m x2.2m x .9m high table & 1 ea .6m x 1.6m x .9m high table & 1 each .6m x 1.0m x .9m high & 3-drawer pedestal on wheels	2 each standard office chair, 10 each 5-drawer file cabinet, 2 each 5-shelf bookcase 2 each .9m x 1.6m x .35m lockable storage cabinet	4 each telephone connection 6 each data connection
Semi-private Cubicle	2	10	20	1 each Workstation (1 ea .75m x2.2m x .9m high table & 1 ea .6m x 1.6m x .9m high table & 1 each .6m x 1.0m x .9m high & 3-drawer pedestal on wheels	1 each standard office chair, 1 each 2-drawer file cabinet, 1 each 5-shelf bookcase	1 each telephone connection 2 each data connection

Conference Room	1	15	15	3 each Table 1.2m x 1.2m x .9m table	20 each stackable visitor chairs	1 each telephone connection 1 each data connection
Plans Room combined with sem-private cubicles	1	20	20	4 each Table 1.2m x 2.4 x 1.15m	5 each 5 shelf bookcases 5 each 5 shelf storage rack	2 each telephone connection 2 each data connection
Kitchenette	1	9	9		1 each sink .6m x 2.0m x 1.2m high countertop with under counter cabinets and over counter "kitchen" cabinet Refrigerator .75m x .75m x 1.8m high	1 each telephone connection 2 each GFCI electrical outlets
Men's toilet	1	5	5		1 each toilet 1 each urinal 1 each lavatory 1 each paper towel dispenser 1 each soap dispenser	
Women's toilet	1	4	4		1 each toilet 1 each lavatory 1 each paper towel dispenser 1 each soap dispenser	
Janitor's closet	1	2	2		1 each slop sink	
Telcom closet	1	5	5		Thermostatic-controlled fan	Plywood mounted telephone patch panel & computer router sized to handle computer installation
Total area with 1.3 circulation factor			125			

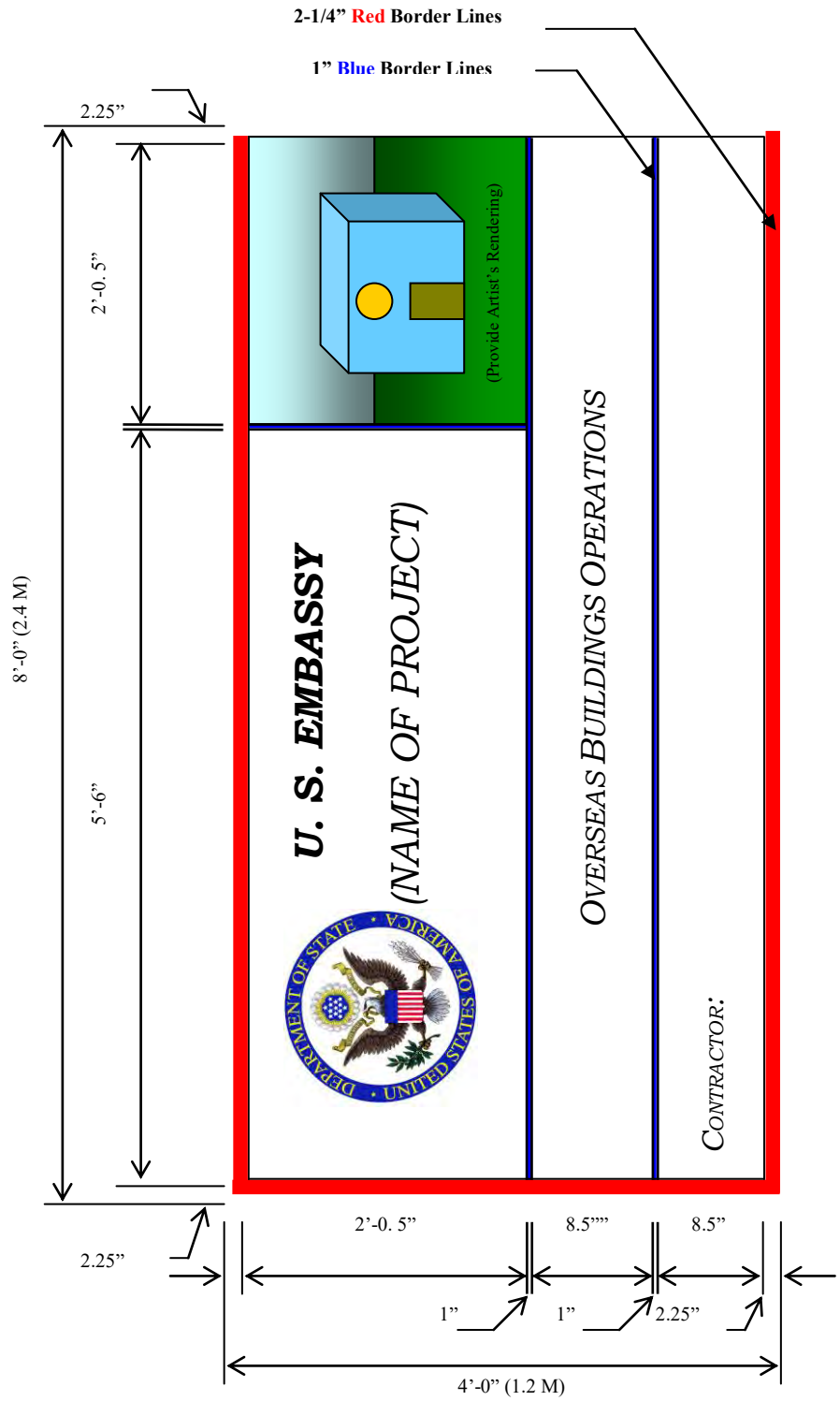
MSGQ **GUAYAQUIL, EQUADOR**

ATTACHMENT "B"
STANDARD PROJECT SIGN



Note: Two (2) 4" x 4" x 10'-0" pointed posts are required to support the sign. Secure posts 3'-6" deep into the ground. Mount sign flush with top of posts.

MSGQ **GUAYAQUIL, EQUADOR**



Note: Two (2) 4" x 4" x 10'-0" pointed posts are required to support the sign. Secure posts 3'-6" deep into the ground. Mount sign flush with top of posts.

3.02 STANDARD PROJECT SIGN

SECTION 017705
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. The requirements of this Section relate to the procedures and administration of Substantial Completion, Final Acceptance, and Warranty.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

1.03 SUBMITTALS

A. The Contractor shall submit, in accordance with Section 013305, *Construction Submittals*, the following:

1. Request for Certification of Substantial Completion.
2. Request for Final Inspection and Testing.
3. Final Record Documents. The Contractor shall submit final documents marked “As-Built” to the Project Director/COR with a request for inspection and Substantial Completion.
4. Project Completion Photography
5. Asbestos and Lead Paint Certification.
6. Warranty Management Plan

1.04 WARRANTY MANAGEMENT AGENT

A. The Contractor shall provide a qualified and cleared U.S. citizen representative, knowledgeable in the operation and maintenance of the various building systems as installed in the works. This representative shall respond immediately (24 hours or less) and be responsible for warranty management. Telephone and email are acceptable means of response. If a visa is required for travel to the Post, a current visa must be maintained by the representative.

B. The agent shall be qualified to address, record, and resolve warranty issues during the warranty period and be certified to act on the Contractor’s behalf during the warranty management period.

C. The agent, at a minimum, shall perform the following duties:

1. Communicate and coordinate actions with the responsible Government representative (normally the Facility Maintenance Manager).

2. Respond to building system deficiencies, including inspection, evaluation, and documentation of such deficiencies.
3. Arrange for repairs or replacements of warrantable deficiencies.
4. Document issues, actions, and solutions and incorporate records as a part of the Project Document Set. The agent shall surrender these records to the Government representative upon termination of the warranty period.
5. Record and develop a report on expected times between failure of system components.
6. As a follow up to warranty actions, the agent shall review procedures with the Government Operating and Maintenance staff and verify agent responsibilities are in compliance with building systems procedures. This will avoid conditions that might lead to warranty action or denial of action.
7. Develop a summary of lessons learned during the warranty management process for incorporation into the Maintenance Plan as described in Section 017825, *Operation and Maintenance Data*.
8. Participate in an on-site warranty meeting within 8 to 11 months after Substantial Completion. The agent shall review the Contractor's warranty management reports with the Project Director/COR (or authorized representative), O&M staff, and OBO's Commissioning agent. The agent will identify additional areas that may come under warranty or under the original construction contract. The agent shall present information to track and correct warranty-related issues prior to expiration of the warranty.

1.05 PRE- WARRANTY CONFERENCE

Prior to contract completion, or completion of any phase or portion of contract to be turned over, and at a time designated by the PD/COR, the Contractor shall meet with the PD/COR and Facilities Manager to develop a mutual understanding with respect to the requirements of this clause. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the PD/COR for the execution of the construction warranty shall be established / reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of representative that is authorized to initiate and pursue warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of his responsibilities in connection with other portions of this provision.

1.06 EQUIPMENT WARRANTY IDENTIFICATION TAGS

A. The Contractor at the time of installation and prior to substantial completion shall provide warranty identification tags on all Contractor- and Government-furnished equipment which he has installed.

1. The tags shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

2. Sample tags shall be submitted for Government review and approval. These tags shall be filled out representative of how the Contractor will complete all other tags.

3. Tags for Warranted Equipment: The tag for this equipment shall be similar to the following: Exact format and size will be as approved.

_____

EQUIPMENT WARRANTY - CONTRACTOR FURNISHED EQUIPMENT
MFG NAME MODEL NO.
SERIAL NO.
CONTRACT NO.
CONTRACTOR NAME
CONTRACTOR WARRANTY EXPIRES
MFG WARRANTY(IES) EXPIRE

_____

_____

EQUIPMENT WARRANTY - GOVERNMENT FURNISHED EQUIPMENT
MFG NAME MODEL NO.
SERIAL NO.
CONTRACT NO.
DATE EQUIP PLACED IN SERVICE
MFG WARRANTY(IES) EXPIRE

_____

4. If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag

5. The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

The Contractor shall comply with the instructions of the Contracting Officer and the Project Director/COR for procedures, sequence, timing, and similar considerations regarding the turnover of facilities to Government personnel.

3.02 SUBSTANTIAL COMPLETION

A. General: Before requesting the Certificate of Substantial Completion from the Project Director/COR for all work or a defined portion thereof, the Contractor shall complete the following, as applicable:

1. Progress Payment Request:
   a. Submit no earlier than the date claimed for Substantial Completion.
   b. Reflect a 100 percent complete status or list non-substantial items that remain incomplete.
      1) Show the percentage of completion and an explanation for incomplete work.
      2) Include copies of supporting documentation.
2. Operation and Maintenance Data: In accordance with Section 017825, *Operation and Maintenance Data*.
3. Obtain and submit releases, enabling full-and unrestricted use of the work and access to services and utilities by the Government. These releases shall include:
   a. Occupancy permits.
   b. Operating certificates.
   c. NFPA required fire protection certifications.
4. Submit Record Documents as described herein. Confidential and Secret Record Documents may be deferred until Final Acceptance.
5. Deliver extra materials in the manner requested by the Project Director/COR. Also, provide a list of delivered materials. These shall include:
   a. Operating and Maintenance tools.
   b. Surplus Government-furnished materials.
   c. Spare parts.
   d. Extra stock of materials (attic stock).
   e. Keys to locks.
6. Changeover:
   a. Make final changeover of facilities and services from temporary to permanent.
   b. Advise the Project Director/COR in advance of the precise time for each changeover.
   c. Comply with the Project Director's/COR's requests on the timing of security-related changeovers.
7. Complete commissioning, start-up testing, and training of the Government's operating and maintenance personnel.

8. Operational data and logs of equipment operated by the contractor prior to turnover.
9. Remove temporary facilities, construction tools and equipment, mock-ups, rejected materials, and similar items of construction not incorporated into permanent work. This removal shall include surplus materials.
10. Report uninstalled Government-furnished furniture to the Project Director/COR.
11. Make physical adjustments, correct minor defects, touch-up finishes, and lubricate operating parts.
12. Provide certification that asbestos and lead paint were not used as building materials in accordance with requirements of Contract Section H.
13. Complete the work listed in the Accreditation Checklist (Refer to Contract Section J.1).
14. Complete turnover of utilities to the Post through the Project Director/COR. See Section 015005, Temporary Facilities and Controls.
15. The contractor's QC Manager shall have ensured that the work complies with Section E.2 of the contract (Substantial Completion) before requesting the Certificate of Substantial Completion from the Project Director/COR. The QC Manager shall be responsible for all inspection activities leading up to the contractor's request for the Certificate of Substantial Completion and shall be prepared to demonstrate that the work is, in fact, substantially complete.

B. Request for Certification of Substantial Completion:

1. Following inspection, the QC Manager shall provide the Project Director/COR with a schedule of defects. Defects deemed to be substantially out of compliance with contract quality or performance standards shall be corrected prior to issuance of the Certificate of Substantial Completion. The QC Manager shall be prepared to demonstrate compliance with the contract to the Project Director/COR as a condition of issuance of the Certificate of Substantial Completion.
2. When the QC Manager has proven the work to be substantially complete, the Project Director/COR will issue the Certificate of Substantial Completion. The Certificate of Substantial Completion may be issued with a list of remaining omissions, deficiencies, and defects deemed by the Project Director/COR to be non-substantial. Such items shall be corrected by the Contractor prior to issuance of the Certificate of Final Acceptance.
3. Schedule of Defects:
   a. Prepare the initial Schedule of Defects as described in Section 014010, *Contractor's Quality Control*.
   b. The initial and subsequent Schedule of Defects shall include omissions, deficiencies, and patent defects and shall be a matter of Project record.
   c. Document and resolve Schedule of Defects items prior to the issuance of the Certificate of Final Acceptance.
4. In addition to the above actions and remedies, the Contractor shall be responsible for omissions, defects, and deficiencies not uncovered in

the course of the inspections. The Project Director/COR will determine the applicability of these items to the agreed upon standards of Contract performance.

3.03 FINAL ACCEPTANCE

A. General:

1. The Contractor shall notify the Project Director/COR at least fifteen (15) calendar days prior to the time when the Contractor believes all work included in the contract will be ready for Final Acceptance. The QC Manager shall initiate final inspections and testing without delay, notify the Project Director/COR in writing if portions of the work are not ready for Final Acceptance, and notify the Project Director/COR whether Final Acceptance for a portion of the work will be delayed beyond Final Acceptance for the majority of the work.

B. Request for Final Inspection and Testing:

1. The Contractor shall submit the following when requesting Final Acceptance of the work:
   a. Schedule of Defects:
      1) Schedule of non-substantial defects attached to the Project Director's/COR's Certificate of Substantial Completion.
      2) Certification of the QC Manager that all defects on the schedule have been completed.
   b. Final Certificates of Insurance for products installed and operations, as required.
   c. Utilities and Services:
      1) Final meter-readings and service-dates for utilities and services paid for by the Contractor.
      2) The Government will pay bills for utilities and services after Substantial Completion unless significant punch list items remain in which case cost-sharing arrangements shall be made with the Contractor. The Contractor shall provide beginning meter-readings and service-dates for utilities and services to be paid by the Government.
      3) Include similar cut-off points, measurements, and readings for stored fuels and other consumable products and services.
   d. If applicable, provide a Project Statement of "Consent of Surety."
   e. Final Application for Payment:
      1) Prepare an updated final statement, showing extended sequence and accounting of final changes to the claimed Contract Price.
      2) Prepare the application for submittal to the Contracting Officer, including copies of supporting documentation not previously submitted and accepted.
      3) Provide a statement acceptable to the Project Director/COR regarding the settlement of liquidated damages.

4) Provide contractor's release of claims in the format provided by the Contracting Officer.

2. Include a statement of the fulfillment of requirements identified herein.
3. If applicable, include a statement listing itemized work items known to be incomplete or deficient, an explanation of why each item is incomplete or deficient, and the Project Director's/COR's endorsement recognizing the circumstances of the specific non-performance.
4. The QC Manager shall proceed with final inspection and testing of the work under the supervision of the Project Director/COR.
5. Following the final inspection, the Project Director/COR will document work items still incomplete or deficient, unfulfilled obligations, and requirements for testing or retesting prior to Final Acceptance.
6. As determined by the Project Director/COR after final inspection, the Contractor shall complete outstanding work items, obligations, tests, and other outstanding actions.
7. Upon the Contractor's satisfactory completion and correction of work items, the Project Director/COR will recommend to the Contracting Officer that he issue the Certificate of Final Acceptance.
8. The Contracting Officer will notify the Contractor of Final Acceptance, negotiate adjustments to the final payment, if necessary, and authorize the release of final payment funds.

3.04 RECORD DOCUMENT SUBMITTALS

A. General:
1. The Contractor shall comply with the requirements of Section 013305, *Construction Submittals*, for the preparation and processing of final Record Document submittals.
2. Refer to each Contract Technical Specification Section for specific Record Document submittal requirements on individual units of work.

B. The Contractor shall develop and maintain an original mark-up set of Contract Documents and Submittals at the Project Site.
1. Ensure availability for the Project Director's/COR's reference.
2. Protect from deterioration and loss.
3. Retain in a secure and fire-resistant space.
4. Do not use for construction purposes.
5. Delineate changes and additional information developed during construction.
   a. Upon request of the Project Director/COR, provide documents or a submittal copy clearly reflecting changes or other data.
   b. Indicate each change by change order number when related to a Contract Modification.

C. Final Record Documents:
1. Updated Basis of Design
2. Record As-Built Drawings
   a. Maintain a full set of the latest revised drawings marked with different colors of pencils or pens.
   b. Clearly define hidden dimensions and similar data that would be difficult to obtain at a later date.

c. Show conditions not clearly detailed by shop drawings or coordination drawings.
d. Show cross-references to other records of final data.
e. Organize marked-up prints into set(s) as originally released at the Project Site.
f. Mark each set for identification and with the date of release as the record copy (Substantial Completion date).
g. Transfer and update “As-Built” drawings in formats per the OBO-ICS IBC Appendix L and Contract Section F.
h. Indicate “As-Built” conditions as documented from actual installation.
i. Provide two (2) sets of CDs/DVDs, one (1) set of full size drawings, and one (1) set of half size drawings.

3. Record Contract Specifications
   a. Maintain a full set, marked up to record minor changes in the printed text and cross-reference other documentation. The use of “Track Changes” shall be considered. Consult with Project Director/COR for approval.
   b. Where additional writing space is needed, insert extra sheets with notations or write on the blank backsides of the preceding pages.
   c. Pay particular attention to accepted substitutions, selection between options, and similar record information.
   d. Give priority to the recording of data that cannot be easily discerned by observation at the Project Site.
   e. Mark each Specification volume as the record copy with identification and the date of release (Substantial Completion date).
   f. Provide three (3) sets of CDs/DVDs and one (1) paper copy.
4. Record Product Data:
   a. Maintain a full set of accepted product data submittals, marked with specific selections of products supplied and installed.
   b. Where changes subsequent to acceptance affected product selection, obtain corrected product data sheets or mark up sheets to reflect changes.
   c. Show any departures from manufacturers' instructions in accordance with Contract Section H.
   d. Mark each submittal with the related Specification number, place in binders by numeric sequence, and identify binders by the Substantial Completion date. Title the binders “Replacement Products Procurement Manual.”
   e. Include reference copies of final warranties, maintenance agreements, workmanship bonds, performance certifications, and similar required documentation of required assurances.
   f. Include final copies of related inspection and test reports, certificates of compliance (with requirements), and similar quality assurance documentation.
5. Record Shop Drawings:
   a. Maintain a full set of accepted shop drawing black-line prints, marked with different colors of pencils or pens.
   b. Cross-reference changes on other documents or submittals.

c. Organize shop drawings into sub-sets as received from each fabricator and identify by related Contract Specification Section number.
d. Reflect the date of release as the record copy (Substantial Completion date).

6. Construction Coordination Documentation:
   a. Submit as a consolidated and organized collection of documents prepared in support of construction coordination as described in Section 011005, *Construction Execution and Coordination*.
   b. Documentation shall include, but not be limited to:
      1) Minutes of meetings.
      2) Submittal register.
      3) Shipping logs.
7. Record Field Samples:
   a. Prior to Substantial Completion, meet with Project Director/COR at the Project Site and determine which of the remaining submitted samples and prepared mockups are required for the Government's continued retention.
   b. Mark each element with appropriate identification and date of Substantial Completion.
   c. Pack in appropriately identified cardboard containers and deliver to the SSA at the Project Site, as designated by the Project Director/COR.
8. Field Engineering Submittals:
   a. Final Site Survey: Make corrections showing buried utilities and similar underground elements, field survey and measurement drawings, and similar drawings.
   b. Final Property Survey:
      1) Prepare and submit in accordance with the requirements of Section 011005, *Construction Execution and Coordination*.
      2) Prepare three black-line copies as digital files in portable document format (.pdf) on CD-ROM in the version of AutoCAD currently specified by the Contract Documents.
   c. Surveyor's Log: Prepare and submit in accordance with Section 011005, *Construction Execution and Coordination*.
9. Operation and Maintenance Data: Refer to Section 017825, *Operation and Maintenance Data*.
10. Training Records: Refer to Section 017905, *Demonstration and Training*.
11. As-Built Project Execution Schedule: Refer to Section 013205, *Project Scheduling*.
12. A copy of the Systems Furniture and Freestanding Project Record Book.
13. Project Completion Photography
    a. Contractor shall provide professional photographic documentation of the project after completion.
    b. Documentation will be part of the permanent project record, and shall be delivered to the USG with the as-built construction documents or as agreed to by the Project Director/COR.
    c. USG shall be the exclusive owner of this documentation.

3.05 WARRANTY

A. Warranty: A warranty shall be provided per Contract Section H: BONDS AND INSURANCE, Contract Section I: WARRANTY AND GUARANTEES and FAR clause 52.246-21 for all facility components and systems.

B. Warranty Management Plan

1. The Contractor shall develop a warranty management plan which shall contain information relevant to the cause Warranty of Construction in FAR 52.246-21. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. In the event of phased turn-over of the contract, the contractor will update his Warranty Management Plan as necessary to include latest information required. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the PD/COR for approval prior to each monthly pay estimate. Approved information and warranties shall be assembled in a binder and shall be turned over to the Government no later than the Substantial Completion date. The General Contractor’s construction warranty period shall begin on the date of substantial completion and shall continue for the full product warranty period. Information contained in the warranty management plan shall include, but shall not be limited to, the following:
2. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.
3. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.
4. A list for each warranted equipment, item, and feature of construction or system indicating:
   a. Name of item
   b. Model and serial numbers
   c. Location where installed
   d. Name and phone numbers of manufacturers or suppliers
   e. Names, addresses and telephone numbers of sources of spare parts, warranties and terms of warranty. This shall include 1 year General Contractor warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates
   f. Cross-reference to warranty certificates as applicable

g. Summary of maintenance procedures required to continue the warranty in force
h. Cross-reference to specific pertinent Operation and Maintenance manuals
i. Organization, names and phone numbers of persons to call for warranty service
j. Typical response time and repair time expected for various warranted equipment
k. The Contractor's plans for attendance at the post-construction warranty meeting conducted by the Government (see para 1.04.C.8, above)
l. Procedure and status of tagging of all equipment covered by extended warranties
m. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons

C. Warranty Management:

1. The Contractor shall provide the Government with a high level of assurance that delivered building systems are free of defects, specified warranties are valid, support systems and methodologies are in place, and Government support staff has a full understanding of the continued operation and maintenance of systems.
2. Disclaimer Limitations: Manufacturer's disclaimers in published product warranties shall not relieve the Contractor of Contract requirements on related product or work.
3. The General Contractor's Warranty Management commences early in the start-up and commissioning phase and ends at a period normally one year (12 months) from the issuance of substantial completion, unless otherwise agreed upon.
4. Submit a plan of action to Post within twenty-four (24) hours after notification of the need for warranty response. Telephone and email are acceptable means of submission.

3.06 CLEANING

A. Initial Cleaning:
1. Except as otherwise indicated, the Contractor shall provide initial cleaning of each non-embedded unit of work promptly upon nominal completion and curing of installation.
2. Maintain in protected and sufficiently clean condition through the remainder of construction to prevent staining or other deleterious effects of soiling.
3. Promptly remove significant soiling, including graffiti deposits, occurring during construction.
4. Comply with product manufacturers' instructions and recommendations, including limitations, for cleaning of exposed surfaces and the use of cleaning substances and devices.

B. Final Cleaning:
   1. Immediately prior to the Project Director's/COR's inspection(s) of work for Certification of Substantial Completion, the Contractor shall repeat cleaning operations and:
      a. Use experienced cleaning personnel.
      b. Use proven methods and materials to achieve the level of cleanliness normally expected for a U.S.-located, first-class, commercial or institutional building Project.
   2. In addition to specific cleaning as may be required by related technical Specification sections herein, the Contractor shall comply with the following as applicable:
      a. Governing regulations including safety standards and environmental protection.
      b. Waste:
         1) Do not burn waste materials at the Project Site.
         2) Dispose of waste materials in a lawful manner and do not bury at the Project Site, except as may be authorized by the Project Director/COR.
         3) Remove rubbish, debris, litter, and unauthorized or unwanted plant growths and weeds.
      c. Dispose of surpluses as required by the Contract.
      d. Do not discharge volatile, dangerous, or deleterious fluids into drainage systems.
      e. Temporary Facilities and Substrates:
         1) Remove temporary facilities including construction tools, equipment, and devices (i.e., buildings, enclosures, and protective coverings).
         2) Restore permanent facilities to prior condition when used for temporary service.
         3) Restore substrates as required.
         4) For additional details, refer to Section 015005, *Temporary Facilities and Controls*.
      f. Clean the entire Project Site, including landscape development areas and Site improvements.
      g. Sweep the paved areas to a broom-clean condition and remove stains, including petrol-chemical spills and similar deposits.
      h. Rake grounds that are neither paved nor planted to a smooth even-textured surface.
      i. Remove debris and dust from limited-access spaces of the Project including roofs, plenums, crawl spaces, shafts, tunnels, trenches, equipment vaults, manholes, attics, and similar spaces.
      j. Clean exterior and interior exposed surfaces to a dirt-free condition, absent of stains, graffiti, films, and other noticeable and deleterious substances.
      k. Restore reflective polishes and applied treatments, including sealed and waxed finishes.
      l. After the removal of spots and stains, vacuum clean interior exposed non-treated concrete surfaces, carpeted areas, and other soft surfaces.
      m. Avoid disruption of natural weathering on certain exposed exterior surfaces.

n. Wipe accessible surfaces clean on mechanical, electrical, and similar equipment and fixtures, including lighting fixtures.
o. Remove excess lubrications and similar substances.
p. Remove exposed-to-view labels not required as permanent labels.
q. Clean transparent materials, including glazed panels and mirrors, to a polished condition free of visible dirt and film. Neatly trim away sealant.
r. Replace broken and noticeably abraded glass and plastic units.
s. Clean and sanitize food service and sanitary, health care, and similar equipment and fixtures for intended use. Remove stains, including those resulting from water exposures.

B. Jointly inspect the entire Project Site with the Project Director/COR. Where required, engage specialized firm(s) to rid the Project Site of roaches, pests, and other vermin.

END OF SECTION

SECTION 017825
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for the preparation and submission of Operation and Maintenance Data.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

B. OBO Global Maintenance Management System (GMMS) Template:
1. The Template is identified as “GMMS”, a spreadsheet document that will contain required O&M data and is attached as 017825A.

C. Systems Manual Benchmark
1. The Benchmark is a sample illustrating the format and content required as specified below

1.03 SUBMITTALS

A. In the development of Operation and Maintenance Data, comply with the Security Classification Guide and submit classified O&M data separate from SBU/Unclassified O&M Data.

B. In accordance with Section 013305, Construction Submittals, and the schedule and requirements listed below, the Contractor shall provide:
1. Operation and Maintenance (O&M) Library:
   a. See paragraph 3.02 “O&M Library Required Documents” for a complete list.
   b. The O&M Library shall be submitted in two formats, hardcopy and digital.
2. GMMS Template:
   a. The Contractor shall complete the OBO GMMS Template that will be used by the Government to upload all required data into the State Department’s approved GMMS to support training of Government O&M personnel, and for the development of the Government’s site-specific O&M program.
3. Preventative Maintenance Checklists:
   a. The Contractor shall provide OBO an electronic output (XMLformat) based on the template provided.

C. Schedule
1. O&M Library:

   a. The Contractor shall submit a draft outline two hundred seventy

(270) calendar days prior to Substantial Completion.

b. The Contractor shall submit two (2) draft hard copies and one (1) CD/DVD version of the complete Maintenance Library certified by the Contractor, one hundred eighty (180) calendar days prior to Substantial Completion.

c. The Government review period on all submittals will be thirty (30) calendar days.

d. Upon receipt of the Government's comments, the Contractor shall make corrections and resubmit, in final form, three (3) hard copies and two (2) CD/DVD versions of the O&M Library with the request for inspection for Substantial Completion.

2. GMMS Template:

a. The Contractor shall provide the completed GMMS Template to the PD so it can be loaded by the Government into post GMMS application in accordance with subparagraph 3.03 sixty (60) calendar days prior to Substantial Completion.

b. The OBO Real Property Administrator (RPA) shall provide building identification numbers into GMMS Template for the Contractor to ensure that each building system has been properly addressed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 OPERATIONS AND MAINTENANCE LIBRARY

A. Hardcopy Format:

1. All documents shall be prepared in English.
2. All documents shall be included within binders:
   a. Use heavy-duty 3-ring, vinyl-covered, high capacity binders, 75 mm (3 inch) minimum.
   b. Binders shall be provided with pockets for storage of folded materials.
   c. Provide full identification on both spine and front cover of each binder.
3. The Library shall be sub-divided using CSI numbers per project specifications.
   a. Each subsection shall have a preprinted heavy duty tabbed divider as its first page.
4. The Contractor shall provide two alphabetical cross-referenced indices, one by manufacturer and one by equipment or system common name (Air-handler, fire pump, chiller, etc).
   a. Indices shall be placed in the front of all binders. The common name index shall appear first followed by the manufacturers index.
   b. In addition to equipment common name, and manufacturer, the Index list shall include ID labels used in the drawings and schedules of these Contract Documents. These ID's shall also appear on the equipment nameplates, refer to paragraph 3.04C below.

c. Indices shall identify binder number and tabbed CSI numbered section of O&M data.

B. Electronic Format on CD/DVD

1. An electronic copy of all submitted O&M library documents shall be created in PDF format.
   a. Electronic copies must be readable by Adobe Acrobat Reader 8.0 or latest version used by OBO.
   b. All PDF documents shall be word searchable.
   c. The electronic format of the indices described above shall be hyperlinked to the O&M product data described below in paragraph 3.02E.
   d. All sections and subsections shall be bookmarked to further facilitate the search functionality.
      1) Each CSI numbered section shall be bookmarked separately within the PDF file. Include the CSI number and the section title in the bookmark name.
      2) Include additional bookmarks for critical documents including Maintenance Plan, etc. within each section.
   e. Directory Structure:
      1) PDF file structure shall mirror the hardcopy deliverable.
         a) Separate PDF files shall be created for each binder. If the information contained in a single binder exceeds the capacity of a single CD/DVD, multiple CD/DVDs may be used, but shall be labeled 1 of X, 2 of X, etc.
      2) Naming Conventions:
         a) Each PDF file shall be named with binder number and included specification sections followed by a PDF extension.
            (1) For example: Binder1 XXXXXX-XXXXXX.pdf.
            (2) When a single CSI section is split between two binders add the word *-partial* following that CSI number.
   f. Image Format:
      1) Black and White: Images shall be scanned into PDF file format with resolution of 150 dpi minimum.
      2) Color: Images shall be scanned into PDF file format, minimum 16 bit colors, with a resolution of 150 dpi minimum.
   g. Labeling:
      1) Discs shall be labeled and include Post name, and month and year of Substantial Completion.
   h. CD/DVD Instructions:
      1) A brief guide for installing and viewing the library documents shall be located in the CD/DVD root directory. This file shall be named “readme.txt.”
      2) A hard copy of readme.txt shall be inserted as the back cover of the CD/DVD jewel case.

3.02 O&M LIBRARY REQUIRED DOCUMENTS

A. An inventory of facilities with building names and ID numbers as assigned by the OBO Real Property Administration (RPA) Program.

B. A complete listing of all equipment and systems. Specify manufacturer, make, model, size, capacity, serial number, building names and location on Project Site, and identifying labels consistent with contract documents.

C. As-built Drawings

D. Final Commissioning Report (Provided by CxA):
   1. Basis of design narratives including Failure Modes and Effects Analysis (FMEA).
   2. Testing, Adjusting and Balancing reports.
   3. Training and Demonstration Records.

E. O&M Manuals
   1. Manuals shall be subdivided by specification section. The first document in each section shall be the Specification text followed by a list of all equipment covered under that section.
   2. Following those two broad documents the Contractor shall locate documents for each piece of maintained equipment from the list above as follows:
      a. Product Description to include:
         1) Manufacturer name.
         2) Model name and number.
         3) Component serial numbers.
         4) Reliability analysis and Criticality designation.
         5) Name, Address, and contact information for Installation subcontractor.
      b. Preventive Maintenance Schedule using the Reliability Centered Maintenance (RCM) approach including:
         1) Maintenance tasks, inspections, and tests by required frequencies equally balanced throughout the calendar year for each PM requirement identifying the designated skill trade, with estimated maintenance labor duration.
         2) Safety and emergency instructions.
         3) Detailed procedures for detecting faults during scheduled or unscheduled servicing.
         4) Information on seasonal adjustments, emergency or partial operating procedures, start-up and shut-down detail, and other operationally significant information.
         5) Maintenance approach.
         6) Precautions against improper use and maintenance.
      c. Manufacturer's Product Data and Technical Literature:
         1) Detailed operating procedures, parameters, and tolerances.
         2) Troubleshooting guides.
         3) Disassembly, repair, and re-assembly instructions.

d. Manufacturer's Warranty information, (those extending more than one year) including copies of warranties, forms, and expiration dates.

e. List of Materials for Operation and Maintenance (Manufacturer's Recommended Spare Parts):

1) A detailed list of materials and spare parts required to operate, maintain, and repair all building systems and installed equipment shall be developed by the Contractor.

a) Derive the list from reliability analyses performed during design phase, local market availability research, and recommendations of original equipment manufacturer.

b) Indicate stocking requirements complete with high/low levels and indicate reorder points. Include estimated procurement lead-time duration, shipping and security requirements, and assigned logistics factors for all items.

(1) Include equipment manufacturer name, address, and telephone number along with at least two additional vendor/suppliers with preference towards local companies and those listed on the GSA Schedule.

f. Shop drawings, wiring diagrams, flow charts, and equipment sequence of operations.

g. Material Safety Data Sheets (MSDS), as required.

h. List of operating and maintenance tools provided and/or recommended.

i. List of diagnostic equipment provided and/or recommended for the proper maintenance and trouble-shooting of installed equipment and systems.

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3.03 GMMS TEMPLATE INSTRUCTIONS

A. OBO GMMS Template is the method used to acquire equipment O&M data.

1. The Template contains all of the fields necessary for the contractor to capture equipment information, warranties, component data and all of the information necessary to establish the Preventive Maintenance (PM) Schedule.
2. When the Template is completed by the contractor, the PD and the FM shall review and validate the information. If complete, the data will be entered into the post GMMS data base in OBO.
3. The Template is provided to the contractor to record all of the required GMMS data. The responsibility remains with the contractor to fulfill the contract specifications regarding the collection and recording of the equipment information and PM schedule data. The preparation of the Template requires a physical inventory.

4. Procedures must be coordinated to allow the contractor to add equipment that is installed after their inventory is conducted.

B. Equipment Information:

1. All fields that apply to the equipment information being recorded must be complete and accurate data. No fields will be blank. Blank fields indicate a requirement for further inventory. DO NOT use N/A for any field.
2. Equipment Types must be from the approved list (Reference Section of the Template) included with the CMMS Template.
3. Major equipment whose failure would result in reduced capacity of the property and requiring an equipment history must be listed individually on the equipment form e.g., generator, chiller, transformer, elevator, AVR, boiler, etc. (For example, separate equipment record for each generator.)
4. Elevators will be populated in the Equipment section and the technical data will be populated in the Elevator Specifications section.
5. Equipment component data is required in the CMMS system.
   a. Components are sub assemblies that can be replaced.
   b. Components are not Spare Parts.
   c. Examples of components are:
      i. Generators – Fuel tank, Filters, Governor etc.
      ii. Chillers – V-belts, Filters, etc.
6. Filters must be components of the equipment they support and not listed separately.

C. Warranty Information:

1. The Warranty section found on each Equipment Information Tab has two sections, a Manufacturer Information and Warranty Information.
   a. Manufacturer Information includes the address of the manufacturer and a phone number and name of a contact person.
   b. Warranty Information required is the manufacturer's warranties that extend beyond the one year General Contractor's warranty period. The General Contractor's one year warranty information is not required to be entered into GMMS.

D. Preventive Maintenance (PM) Schedule:

1. All equipment requiring PM by the manufacturer must be included by calendar time in the Schedule.
2. The Schedule must include all Post equipment. This includes equipment that may not have been part of the construction project.
3. The PM Schedule must be executable.
   a. The number of weekly PM hours shall not exceed the hours of availability for the maintenance staff.
   b. The contractor shall also take seasonal changes into consideration when developing the PM schedule. For example, an outdoor

generator should not have the annual PM scheduled during the winter months.

c. Equipment that has been in use by the contractor will have its start date entered in the remarks section of the PM schedule. The initial PM scheduled for equipment used by the contractor will be computed from the actual start date of the equipment.

4. The PM checklists used in scheduling PM shall be from the PM Checklist displayed in the Reference section of the Template. PM Checklists that are required but not included in the PM Checklist reference section will have an electronic copy of the checklist submitted with the approved Template.
5. Generators used in a power plant should be scheduled for PM by using the Meter Reading section within the Equipment Tab. Standby generators are scheduled for PM by calendar time.

3.04 POSTED INSTRUCTIONS

A. Operation and Maintenance Instructions:

1. Unless otherwise indicated the Contractor shall post O&M instructions at principal units of operational equipment, components, and building systems. They shall include instructions for safety, security, and mandatory protective devices. Instructions shall include, but not be limited to:
   a. Start-up and shut-down procedures.
   b. Control sequences.
   c. Wiring diagrams and layouts.
   d. System piping diagrams, valve locations, etc
2. Emergency information shall be posted in English and the host country predominant language, and shall include international pictorial-graphic symbols.
3. Instructions Mounting and Location:
   a. Attach to or locate near each component, system, or piece of equipment.
   b. Frame in Plexiglas or similar material.
   c. Illuminate, as necessary, to ensure readability.
   d. Provide permanent, protected, tamper-resistant signage, appropriate to the exposure conditions.
   e. Locate for convenience of O&M personnel, but concealed from others, except in the case of general-usage and emergency facilities.

B. Equipment Dataplates:

1. The Contractor shall provide permanent information plate on each item of operating equipment which is connected with services, has operating parts, or is likely to require servicing, parts replacements, control, testing, or similar care and maintenance.
2. Dataplates shall be located inconspicuously, but allow for ease of use in operating, maintenance, and replacement procedures.
3. Appropriate information shall be provided on dataplates in each case, including the following minimum data as applicable:

a. Name of manufacturer and product.
b. Date of manufacture and installation.
c. Model designation and serial number.
d. Capacity, speed, service rating, weight, and similar operational data.

C. Labels and Nameplates:
1. The Contractor shall provide permanent product labels and nameplates, including certified compliance stamps and similar required product markings.
2. Labels and nameplates shall be accessible but not readily visible to general occupants from either exterior or interior.
3. Except as otherwise indicated the size of plates and printing shall be limited for ease of reading from a distance of 350 mm.
4. Except for required safety/emergency signage, permanently attached labels, nameplates, trade names, trademarks, and similar markings on product surfaces shall not be exposed to view by general occupants.
5. The Contractor shall comply with any Project Director's/COR's requests for removal of non required markings, and for removal/replacement or refinishing of products disfigured by such markings

END OF SECTION

Global Maintenance Management System (GMMS) Template

This template has been designed to allow equipment inventories to be entered in a manner that will facilitate import into the Web.WOW application.

An effort has been made to ensure that the information entered will be imported correctly, by providing data validations, by protecting the worksheets, and by providing VBA code to ensure referential integrity. This effort is not an attempt to provide security for the information - these validations / protections could certainly be lifted by the user - but any resulting information entered may not import correctly.

This template requires that macros (VBA code) be enabled. If you do not see a hyperlink below, macros are disabled. To enable macros, find the Macros warning at the top of this sheet, click on the Options button, and 'enable macros'.

To begin, start by entering equipment

Equipment Location
Identification
General
Warranty
Meter
Component
Elevator/Convey

Step 1 - Equipment

If the first two sheets are filled in, you should have enough information to enter equipment information in. Enter in as much information as possible; at the very least, the Property, Equipment Type, and Location *must* be filled in. Manufacturer and Model should be entered in to the greatest extent as well.

As equipment is entered in, the ID column is automatically filled out. This is simply the current count of the equipment rows but is useful in identifying the equipment in the Equipment Components sheet.

	Physical Location				
	Property	Unit	Location	ID	Equipment Type

	Identification								
Manufacturer	Manufacturer Address	Manufacturer Phone	Model	Serial Number	Year Installed	Capacity	Motor Number	CFM Rating	GPM Rating

General Information								Warranty			
Volts AC Input	Volts AC Output	Volts DC	Amps	Hz	Phase	Hp	Remarks	Warranty Company	Address	Phone	Contact Name

Information					Meter Information				Component Information	Elevator/Convey
Warranty Number	Start Date	End Date	Renewal Option	Warranty Remarks	Meter ID	Description	Offset	Unit of Measure	Components	Specifications

Step 2 - Equipment Components

Equipment may have one or more servicable components (parts that can be serviced or replaced). *Information in this worksheet is not required by the Work Orders application* but the worksheet is included for completeness in case contractual requirements state the need to inventory components as well.

If information is entered on this worksheet, the primary required information are the Equipment ID , Component Description, and Template.

	Equipment ID	CTT Code	Component Description	Quantity	Manufacturer

Manufacturer Address	Manufacturer Phone	Model	Serial Number	Template	Battery / Filter Type	Battery / Filter Size	Capacity	Motor Number

CFM Rating	GPM Rating	Volts AC Input	Volts AC Output	Volts DC	Amps	Hz	Ph	Hp	Remarks

Step 2-B - Elevator/Conveying System Specifications

For Division 14 Equipment - Elevator and Conveying Systems, additional Technical Information must be provided.

For each Elevator or Conveying System identified, the Local Unit ID, Job ID, Equipment Traction Code/Drive, Duty and Safety Regulation Guidelines and Year are required.

For Speed, Capacity, and Travel the Metric (measurement) used must be specified if a non-zero value was entered.

	Equipment ID	Equipment Traction Code	Local Unit ID	Capacity	Capacity Metric	Group ID	Persons	Install Date

Technical Specifications										
Speed	Speed Metric	Job Number	Stops	Entrances	Travel	Travel Metric	Safety Regulation	Safety Reg Year	Operation	Duty

Step 3 - PM Checlkists

Equipment may have one or more manufactured defined Preventative Maintenance to ensure the equipment operates to its maximum performance. For each PM that will need to be performed, the Equipment ID, Frequency and the Checklist describing the steps involved in the maintenance - referred to as the PM Schedule ID - must be provided.

In the case of the PM Schedule ID, a list of common checklist followed by the Department of State are provided. Detailed information about these checklist was included seperately.

<u>If the checklist is manufactured specific or is not in the common list</u>, Please select "Other" and identify the Checklist in the comments if the checklist is not among the provided list. A copy of the "Other" checklist must be submitted with the template.

EL01MO

	Equipment ID	Equipment Type	Frequency	Property Name	Item Description	Active Quantity	Status	PM Schedule ID	Shop Code	PM Start Date	Comments

Information on this worksheet is used for reference only and should not be modified.

Equipment Type List

Code	Description
AB	ABSORPTION UNIT
AC	AIR CONDITIONER
ACC	A/C CONDENSER
ACH	AIR CLEANERS, HONEY
ACPC	A/C PRESSURE CLEANER
ACSR	AC, COMPUTER/SERVER ROOM
ACT	ACTIVATOR
AG	AGITATOR,WASHING MACHINE
AH	AIR HANDLER
AH2EX	AIR HANDLER, 2 SMOKE EXHAUST
AHSR	AIR HANDLER, COMPUTER/SERVER ROOM
AIC	AIR CLEANER
AIRMU	AIR, MAKE-UP
AIRMX	AIR MIX
AIRP	AIR PURIFIER
AIS	AIR SYSTEM
AIT	AIR TERMINAL UNIT
AK	AIR CURTAIN
AL	ALARM
ALP	AEIRIAL LIFT PLATFORMS
ALP	AEIRIAL LIFT PLATFORMS
APF	APPLIANCE, GENERAL
APF	FILTER, AIR
APK	APPLIANCE, KITCHEN
APL	APPLIANCE, LAUNDRY
AQ	AUTOMATIC QUEING
AR	AIR COMPRESSOR
ART	MURALS, PAINTING, SCULPTURES, ETC
AS	AC SPLIT UNIT
ASSMB	BURNER, ASSEMBLY
ATR	AIR RETURN TEMP
AV	AUDIO/ VISIAL UNIT
AW	AC, WINDOW-UNIT
AWN	AWNING
BARR	BARRIER, Generic
BAS	BUILDING AUTOMATION SYSTEM (BAS)
BASD	BAS, DDC
BASR	BAS, ROUTER
BB	BOILER, HEAT/OILFIRED
BC	BATTERY CHARGER
BF	BIFURCATED
BIO	SAFETY, BIOLOGICAL
BK	BREAKER
BKHT	BREAKER, H.T. (HIGH-TENSION)
BL	BLOWER
BLA	BLOWER, AIR
BO	BOILER, HOT WATER
BOLL	BOLLARDS
BP	PUMP, BOOST
BPS	PUMP, SUPPLY BOOSTER
BR	BATTERY RACK
BROW	BROWER UNIT #1,M-3HP
BRSYS	BATTERY SYSTEM
BRUTE	BRUTE CONTAINER
BS	BOILER, STEAM
BT	BATTERY TANK
BU	BUSWAY
BUILD	BUILDING
BURN	BURNER
BURNG	BURNER, GAS
BURNO	BURNER, OIL
C02	CARBON DIOXIDE/MONOXIDE SENSON
CAP	CAPACITOR
CAPCR	CAPACITOR, CORRECTION

Component Templates

Component Template
ALL
Control
Tank Wall
Governors/Battery
Radiators
Filters

Frequency List

Code	Description	Lookup
2D	EVERY 2 DAYS	2D - EVERY 2 DAYS
2M	EVERY 2 MONTHS	2M - EVERY 2 MONTHS
2Y	EVERY 2 YEARS	2Y - EVERY 2 YEARS
3M	EVERY 3 MONTHS	3M - EVERY 3 MONTHS
3Y	EVERY 3 YEARS	3Y - EVERY 3 YEARS
4M	EVERY 4 MONTHS	4M - EVERY 4 MONTHS
4Y	EVERY 4 YEARS	4Y - EVERY 4 YEARS
5Y	EVERY 5 YEARS	5Y - EVERY 5 YEARS
AN	ANNUAL	AN - ANNUAL
BA	BI-ANNUAL	BA - BI-ANNUAL
BM	BI-MONTHLY	BM - BI-MONTHLY
BW	BI-WEEKLY	BW - BI-WEEKLY
DA	DAILY	DA - DAILY
MO	MONTHLY	MO - MONTHLY
QU	QUARTERLY	QU - QUARTERLY
SA	SEMI-ANNUAL	SA - SEMI-ANNUAL
WK	WEEKLY	WK - WEEKLY

Shop Codes

STT Code	Shop Name	Shop Description
AC	AIR CONDITIONING	AC - AIR CONDITIONING
AD	ADMIN	AD - ADMIN
AP	APPLIANCES	AP - APPLIANCES
BA	BASEMENT	BA - BASEMENT
CA	CARPENTRY	CA - CARPENTRY
CS	CUSTODIAN	CS - CUSTODIAN
CT	CONTRACTOR	CT - CONTRACTOR
DR	DRIVER	DR - DRIVER
EL	ELECTRICAL	EL - ELECTRICAL
EN	ELECTRICIAN	EN - ELECTRICIAN
EP	EQUIPMENT OPERATOR	EP - EQUIPMENT OPERATOR
FM	FACILITIES MGR	FM - FACILITIES MGR
GA	GARDENERS	GA - GARDENERS
GL	GENERAL	GL - GENERAL
GN	GENERATOR	GN - GENERATOR
GS	GSO TO LANDLORD	GS - GSO TO LANDLORD
HS	HEATING	HS - HEATING
HV	HVAC	HV - HVAC
LS	LOCKSMITH	LS - LOCKSMITH
MA	MASON	MA - MASON
MF	MAINT FOREMAN	MF - MAINT FOREMAN
MI	MAINT. INSPECTOR	MI - MAINT. INSPECTOR
MM	MAINTENANCE MAN	MM - MAINTENANCE MAN
MO	MAINTENANCE OFFICE	MO - MAINTENANCE OFFICE
MR	MAINT CREW	MR - MAINT CREW
MS	MAINT SUPERVISOR	MS - MAINT SUPERVISOR
P2	PREVENTIVE MAINT.#2	P2 - PREVENTIVE MAINT.#2
PA	PAINTING	PA - PAINTING
PL	PLUMBING	PL - PLUMBING
PM	PM CREW	PM - PM CREW
PR	PLANT ROOM	PR - PLANT ROOM
SB	SEABEE	SB - SEABEE

Checklist Names

Word Name	WOW Name	BMIS Name	File Name
<BLANK>	<BLANK>		<BLANK> -
A02-AN	A02-AN	AC SPLIT SYSTEM , CONDENSER/HE	A02-AN - AC SPLIT SYSTEM , CONDENSER/HEAT PUMP
A03-AN	A03-AN	AC SPLIT SYSTEM, EVAPORATOR	A03-AN - AC SPLIT SYSTEM, EVAPORATOR
A03-QU	A03-QU	AC SPLIT SYSTEM, EVAPORATOR	A03-QU - AC SPLIT SYSTEM, EVAPORATOR
A04-QU	A04-QU	AIR COMPRESSOR (OIL-LESS)	A04-QU - AIR COMPRESSOR (OIL-LESS)
A07-SA	A07-SA	HUMIDIFIER	A07-SA - HUMIDIFIER
A11-AN	A11-AN	AIR COOLED CHILLER (YORK MOD Y(	A11-AN - AIR COOLED CHILLER (YORK MOD YCAV/YCIV)
A11-QU	A11-QU	AIR COOLED CHILLER (YORK MOD Y(	A11-QU - AIR COOLED CHILLER (YORK MOD YCAV/YCIV)
A11-SA	A11-SA	AIR COOLED CHILLER (YORK MOD Y(	A11-SA - AIR COOLED CHILLER (YORK MOD YCAV/YCIV)
A11-WK	A11-WK	AIR COOLED CHILLER (YORK MOD Y(	A11-WK - AIR COOLED CHILLER (YORK MOD YCAV/YCIV)
A14-AN	A14-AN	AIR COOLED CHILLER (YORK MODEL	A14-AN - AIR COOLED CHILLER (YORK MODEL YCAL)
A14-MO	A14-MO	AIR COOLED CHILLER (YORK MODEL	A14-MO - AIR COOLED CHILLER (YORK MODEL YCAL)
A14-QU	A14-QU	AIR COOLED CHILLER (YORK MODEL	A14-QU - AIR COOLED CHILLER (YORK MODEL YCAL)
A14-SA	A14-SA	AIR COOLED CHILLER (YORK MODEL	A14-SA - AIR COOLED CHILLER (YORK MODEL YCAL)
A17-AN	A17-AN	AIR HANDLING UNIT (DIRECT DRIVE)	A17-AN - AIR HANDLING UNIT (DIRECT DRIVE)
A17-MO	A17-MO	AIR HANDLING UNIT (DIRECT DRIVE)	A17-MO - AIR HANDLING UNIT (DIRECT DRIVE)
A17-QU	A17-QU	AIR HANDLING UNIT (DIRECT DRIVE)	A17-QU - AIR HANDLING UNIT (DIRECT DRIVE)
A17-SA	A17-SA	AIR HANDLING UNIT (DIRECT DRIVE)	A17-SA - AIR HANDLING UNIT (DIRECT DRIVE)
A22-AN	A22-AN	DRYCOOLER	A22-AN - DRYCOOLER
A23-AN	A23-AN	AIR COOLED CHILLER (ARCTICHILL)	A23-AN - AIR COOLED CHILLER (ARCTICHILL)
A23-MO	A23-MO	AIR COOLED CHILLER (ARCTICHILL)	A23-MO - AIR COOLED CHILLER (ARCTICHILL)
AC03AN	AC03AN	AIR CONDITIONER	AC03AN - AIR CONDITIONER
AC03QU	AC03QU	AIR CONDITIONER	AC03QU - AIR CONDITIONER
ACC01AN	A-11	A/C Condenser	ACC01AN - A/C Condenser
ACC01SA	A-04	A/C Condenser	ACC01SA - A/C Condenser
ACSR01AN	AC04AN	AC, COMPUTER/SERVER ROOM	ACSR01AN - AC, COMPUTER/SERVER ROOM
ACSR01MO	AC04MO	AC, COMPUTER/SERVER ROOM	ACSR01MO - AC, COMPUTER/SERVER ROOM
ACS-SA	ACS-SA	Air Cleaning System (SemiAnnual)	ACS-SA - Air Cleaning System (SemiAnnual)
ACxxQU	AC03	AIR CONDITIONER	ACxxQU - AIR CONDITIONER
AH01AN	AH01AN	AIR HANDLER	AH01AN - AIR HANDLER
AH01QU	AH01QU	AIR HANDLER	AH01QU - AIR HANDLER
AHU-AN	AHU-AN	Air Handling Unit (Annual)	AHU-AN - Air Handling Unit (Annual)
AHU-PO-AN	AHU-PO-AN	Packaged Outdoor Air Handling Unit (An	AHU-PO-AN - Packaged Outdoor Air Handling Unit (Annual)
AHU-PO-QU	AHU-PO-QU	Packaged Outdoor Air Handling Unit (Qu	AHU-PO-QU - Packaged Outdoor Air Handling Unit (Quarterly)
AHU-PO-SA	AHU-PO-SA	Packaged Outdoor Air Handling Unit (Se	AHU-PO-SA - Packaged Outdoor Air Handling Unit (SemiAnnual)
AHU-QU	AHU-QU	Air Handling Unit (Quarterly)	AHU-QU - Air Handling Unit (Quarterly)
AHU-SA	AHU-SA	Air Handling Unit (SemiAnnual)	AHU-SA - Air Handling Unit (SemiAnnual)
AL01AN	AL01AN	ANNUNCIATOR, FIRE ALARM	AL01AN - ANNUNCIATOR, FIRE ALARM
AL01SA	AL01SA	ANNUNCIATOR, FIRE ALARM	AL01SA - ANNUNCIATOR, FIRE ALARM
APP-SA	APP-SA	Appliances - General (SemiAnnual)	APP-SA - Appliances - General (SemiAnnual)
AR01AN	AM01AN	AIR COMPRESSOR	AR01AN - AIR COMPRESSOR
AR01QU	AM01QU	AIR COMPRESSOR	AR01QU - AIR COMPRESSOR
AR01SA	AM01SA	AIR COMPRESSOR	AR01SA - AIR COMPRESSOR
AS01AN	AC05AN	AC SPLIT UNIT	AS01AN - AC SPLIT UNIT
AS01QU	AC05QU	AC SPLIT UNIT	AS01QU - AC SPLIT UNIT
AS-AN	AS-AN	Air Separator (Annual)	AS-AN - Air Separator (Annual)
AVR-AN	AVR-AN	Automatic Voltage Regulator (Annual)	AVR-AN - Automatic Voltage Regulator (Annual)
AW01AN	AC07AN	AC MACHINE, WINDOW UNIT	AW01AN - AC MACHINE, WINDOW UNIT
AW01QU	AC07QU	AC MACHINE, WINDOW UNIT	AW01QU - AC MACHINE, WINDOW UNIT
B01-SA	B01-SA	CHARGER, BATTERY	B01-SA - CHARGER, BATTERY
B04-2Y	B04-2Y	BOILER, GAS OR FUEL OIL	B04-2Y - BOILER, GAS OR FUEL OIL
B04-SH	B04-SH	BOILER, GAS OR FUEL OIL	B04-SH - BOILER, GAS OR FUEL OIL
B04-ST	B04-ST	BOILER, GAS OR FUEL OIL	B04-ST - BOILER, GAS OR FUEL OIL
B09-3Y	B09-3Y	HYDRAULIC ACTUATOR, GATE (HY-S	B09-3Y - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B09-5Y	B09-5Y	HYDRAULIC ACTUATOR, GATE (HY-S	B09-5Y - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B09-AN	B09-AN	HYDRAULIC ACTUATOR, GATE (HY-S	B09-AN - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B09-MO	B09-MO	HYDRAULIC ACTUATOR, GATE (HY-S	B09-MO - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B09-QU	B09-QU	HYDRAULIC ACTUATOR, GATE (HY-S	B09-QU - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B09-WK	B09-WK	HYDRAULIC ACTUATOR, GATE (HY-S	B09-WK - HYDRAULIC ACTUATOR, GATE (HY-SECURITY)
B11-AN	B11-AN	HYDRAULIC ACTUATOR, GATE (NOR	B11-AN - HYDRAULIC ACTUATOR, GATE (NORSHIELD)
B11-MO	B11-MO	HYDRAULIC ACTUATOR, GATE (NOR	B11-MO - HYDRAULIC ACTUATOR, GATE (NORSHIELD)
B11-QU	B11-QU	HYDRAULIC ACTUATOR, GATE (NOR	B11-QU - HYDRAULIC ACTUATOR, GATE (NORSHIELD)
B13-MO	B13-MO	BARRIERS/GATES	B13-MO - BARRIERS/GATES
B13-SA	B13-SA	BARRIERS/GATES	B13-SA - BARRIERS/GATES

CAPPF	CAPACITOR, POWER
CB	CIRCUIT BREAKER
CBX	CONTROL BOX
CC	CARBONATOR
CCCOMP	COIL, COOLING COMPRESSOR
CCDIS	DISCHAR, COOLING COIL
CCEN	CONTROL CENTER
CCFL	FILTER, COOLING TOWER
CCTEMP	DIS TEMP SE, COOLING COIL
CCVA	VALVE, COOLING COIL
CDH	*COMPACT DISTRICT HEA (No Manufacturer)
CE-BS	Beam Scaffolding
CE-CS	Carriage Scaffolding
CE-DW	DUMBWAITERS
CE-DWE	Electric Dumbwaiters
CE-DWH	Hydraulic Dumbwaiters
CE-DWM	Manual Dumbwaiters
CE-EL	Electric Traction Elevators
CE-EMW	ESCALATORS AND MOVING WALKS
CE-EP	Elevating Platforms
CE-ESC	Escalators
CE-ETF	Electric Traction Freight Elevators
CE-ETP	Electric Traction Passenger Elevators
CE-ETR	Electric Traction Residential Elevators
CE-ETS	Electric Traction Service Elevators
CE-HFE	Hydraulic Freight Elevators
CE-HPE	Hydraulic Passenger Elevators
CE-HRE	Hydraulic Residential Elevators
CE-HS	Hook Scaffolding
CE-HSE	Hydraulic Service Elevators
CE-IWC	Inclined Wheelchair Lifts
CE-LF	LIFTS
CE-LUL	Limited-Use/Limited-Application Elevators
CE-MW	Moving Walks
CE-SCF	SCAFFOLDING
CE-SL	Stage Lifts
CE-SL	Sidewalk Lifts
CE-SLP	Scissor Lift Platforms
CE-SS	Suspended Scaffolding
CE-TPL	Telescoping Platform Lifts
CE-VL	Vehicle Lifts
CE-VWC	Vertical Wheelchair Lifts
CEIL	CEILING
CENV	CONTROL, ENVIRONMENTAL
CF	CHEMICAL FEEDER
CFR	REGULATOR, CONSTANT FLOW
CH	CHILLER
CHAC	CHILLER, WATER AC
CHEM	CHEMICAL TREATMENT
CHEMSK	SKID, CHEMICAL TREATMENT
CHFN	CHILLER, FAN
CHMNY	CHIMNEY
CHPO	CHILLER, WATER PUMP
CHTB	CHILLER, TUBE CLEANER
CHWSS	CHILLER, WATER SIDE-STREAMED
CIMS	PUMP, ELECTRONIC METERING
CLEAN	EQUIPMENT, CLEANING
CLOCK	CLOCK
CLOCK	CLOCK TIME
CMON	CONTROL MODULE
CMS	CONTRACTOR MAINTAINED SYSTEM
CN	CONDENSING UNIT
CNH	CENTRAL HEAT
CNHBO	BOILER, CENTRAL HEAT
CO	COIL, HEATING
COHW	COIL, HOT WATER
COL	COOLER
COLDRY	COOLER, DRY
COMP	COMPRESSOR

SI	SAFETY INSPECTOR	SI - SAFETY INSPECTOR
SP	SPECIAL CREW	SP - SPECIAL CREW
ST	STORE	ST - STORE
SY	SECURITY UPGRADING	SY - SECURITY UPGRADING
TH	TRADES HELPER	TH - TRADES HELPER
UF	UTILITIES FOREMAN	UF - UTILITIES FOREMAN
WS	WELDING SHOP	WS - WELDING SHOP

B13-WK	B13-WK	BARRIERS/GATES	B13-WK - BARRIERS/GATES
B14-QU	B14-QU	BARRIER, VEHICLE	B14-QU - BARRIER, VEHICLE
B14-WK	B14-WK	BARRIER, VEHICLE	B14-WK - BARRIER, VEHICLE
BACK-AN	BACK-AN	Backflow Preventer (Annual)	BACK-AN - Backflow Preventer (Annual)
BAS-AN	BAS-AN	BAS Panel (Annual)	BAS-AN - BAS Panel (Annual)
BC01QU	BC01QU	BATTERY CHARGER	BC01QU - BATTERY CHARGER
BIOCAB-AN	BIOCAB-AN	Biological Cabinet (Annual)	BIOCAB-AN - Biological Cabinet (Annual)
BIOCAB-QU	BIOCAB-QU	Biological Cabinet (Quarterly)	BIOCAB-QU - Biological Cabinet (Quarterly)
BIOCAB-SA	BIOCAB-SA	Biological Cabinet (SemiAnnual)	BIOCAB-SA - Biological Cabinet (SemiAnnual)
BO02AN	BO02AN	BOILER, HOT WATER	BO02AN - BOILER, HOT WATER
BO03AN	BO03AN	BOILER, HOT WATER	BO03AN - BOILER, HOT WATER
BOxxAN	B-03	BOILER, HOT WATER	BOxxAN - BOILER, HOT WATER
BOxxAN	B-05	BOILER, HOT WATER	BOxxAN - BOILER, HOT WATER
BS01QU	E-81	BATTERY SYSTEM	BS01QU - BATTERY SYSTEM
BS02QU	E-82	BATTERY SYSTEM	BS02QU - BATTERY SYSTEM
BSC-SA	BSC-SA	Biological Safety Cabinet (SemiAnnual)	BSC-SA - Biological Safety Cabinet (SemiAnnual)
BURNO01AN	BO01AN	BURNER, OIL	BURNO01AN - BURNER, OIL
C04-QU	C04-QU	CENTRAL MINI-COMPUTER (BLDG CT	C04-QU - CENTRAL MINI-COMPUTER (BLDG CTRL SYSTEM)
C06-2Y	C06-2Y	CONTROLLERS, CENTRAL SYSTEM, I	C06-2Y - CONTROLLERS, CENTRAL SYSTEM, HVAC
C06-QU	C06-QU	CONTROLLERS, CENTRAL SYSTEM, I	C06-QU - CONTROLLERS, CENTRAL SYSTEM, HVAC
C06-SA	C06-SA	CONTROLLERS, CENTRAL SYSTEM, I	C06-SA - CONTROLLERS, CENTRAL SYSTEM, HVAC
CALL-AN	CALL-AN	Call Station, Nurse (Annual)	CALL-AN - Call Station, Nurse (Annual)
CB013Y	E-26	CIRCUIT BREAKER	CB013Y - CIRCUIT BREAKER
CB023Y	E-27	CIRCUIT BREAKER	CB023Y - CIRCUIT BREAKER
CB03AN	E-29	CIRCUIT BREAKER	CB03AN - CIRCUIT BREAKER
CB04AN	E-40	CIRCUIT BREAKER	CB04AN - CIRCUIT BREAKER
CH-AN	CH-AN	Air-cooled Screw Chiller (Annual)	CH-AN - Air-cooled Screw Chiller (Annual)
CHEMGLY-MO	CHEMGLY-MO	Chemical Treatment, GLYCOL (Monthly)	CHEMGLY-MO - Chemical Treatment, GLYCOL (Monthly)
CHEMMOLY-MO	CHEMMOLY-MO	Chemical Treatment, Molybdenum Treatr	CHEMMOLY-MO - Chemical Treatment, Molybdenum Treatment (Monthly)
CH-MO	CH-MO	Air-cooled Screw Chiller (Monthly)	CH-MO - Air-cooled Screw Chiller (Monthly)
CH-QU	CH-QU	Air-cooled Screw Chiller (Quarterly)	CH-QU - Air-cooled Screw Chiller (Quarterly)
CH-SA	CH-SA	Air-cooled Screw Chiller (SemiAnnual)	CH-SA - Air-cooled Screw Chiller (SemiAnnual)
CH-WK	CH-WK	Air-cooled Screw Chiller (Weekly)	CH-WK - Air-cooled Screw Chiller (Weekly)
CLEAN01QU	S-10	EQUIPMENT, CLEANING	CLEAN01QU - EQUIPMENT, CLEANING
CLEAN01SA	F-40	EQUIPMENT, CLEANING	CLEAN01SA - EQUIPMENT, CLEANING
CLEAN01SA	V-01	EQUIPMENT, CLEANING	CLEAN01SA - EQUIPMENT, CLEANING
CPEL07AN	CV07AN	CONTROL, ELECTRICAL	CPEL07AN - CONTROL, ELECTRICAL
CT01AN	CT01AN	COOLING TOWER	CT01AN - COOLING TOWER
D07-QU	D07-QU	FLOOR DRAINS	D07-QU - FLOOR DRAINS
D08-SA	D08-SA	SECURITY DOOR GROUP, LARGE	D08-SA - SECURITY DOOR GROUP, LARGE
D09-SA	D09-SA	SECURITY DOOR GROUP, SMALL	D09-SA - SECURITY DOOR GROUP, SMALL
D13-AN	D13-AN	DOOR, OVERHEAD COILING (AUTOM	D13-AN - DOOR, OVERHEAD COILING (AUTOMATIC)
D13-SA	D13-SA	DOOR, OVERHEAD COILING (AUTOM	D13-SA - DOOR, OVERHEAD COILING (AUTOMATIC)
D14-AN	D14-AN	DOOR, HATCH	D14-AN - DOOR, HATCH
DA01AN	DR03AN	DOOR, AUTOMATIC	DA01AN - DOOR, AUTOMATIC
DAB-SA	DAB-SA	Drop Arm Barrier (SemiAnnual)	DAB-SA - Drop Arm Barrier (SemiAnnual)
DB01AN	DB01AN	BARRIER, DELTA PHALANX STYLE	DB01AN - BARRIER, DELTA PHALANX STYLE
DB01MO	DB01MO	BARRIER, DELTA PHALANX STYLE	DB01MO - BARRIER, DELTA PHALANX STYLE
DB01QU	DB01QU	BARRIER, DELTA PHALANX STYLE	DB01QU - BARRIER, DELTA PHALANX STYLE
DB01SA	DB01SA	BARRIER, DELTA PHALANX STYLE	DB01SA - BARRIER, DELTA PHALANX STYLE
DCS-SA	DCS-SA	Dust Collector System (SemiAnnual)	DCS-SA - Dust Collector System (SemiAnnual)
DG01AN	DG01AN	DRAINS, STORM SEW	DG01AN - DRAINS, STORM SEW
DH01AN	DH01AN	DEHUMIDIFIER	DH01AN - DEHUMIDIFIER
DH01MO	DH01MO	DEHUMIDIFIER	DH01MO - DEHUMIDIFIER
DHRC-AN	DHRC-AN	Dedicated Heat Recovery Chiller (Annual	DHRC-AN - Dedicated Heat Recovery Chiller (Annual)
DHRC-QU	DHRC-QU	Dedicated Heat Recovery Chiller (Quarte	DHRC-QU - Dedicated Heat Recovery Chiller (Quarterly)
DHRC-SA	DHRC-SA	Dedicated Heat Recovery Chiller (SemiA	DHRC-SA - Dedicated Heat Recovery Chiller (SemiAnnual)
DHRC-WK	DHRC-WK	Dedicated Heat Recovery Chiller (Weekly	DHRC-WK - Dedicated Heat Recovery Chiller (Weekly)
DM01AN	DM01AN	DAMPER, REMOTE AI	DM01AN - DAMPER, REMOTE AI
DM01SA	C-03	DAMPER, REMOTE AI	DM01SA - DAMPER, REMOTE AI
DM01SA	DM01SA	DAMPER, REMOTE AI	DM01SA - DAMPER, REMOTE AI
DoorC-AN	DoorC-AN	DOOR, Coil (Annual)	DoorC-AN - DOOR, Coil (Annual)
DoorC-SA	DoorC-SA	DOOR, Coil (SemiAnnual)	DoorC-SA - DOOR, Coil (SemiAnnual)
DOORF01QU	F-11	FIRE DOOR	DOORF01QU - FIRE DOOR
DOORF02QU	F-12	FIRE DOOR	DOORF02QU - FIRE DOOR
DRAIN01AN	D-06	DRAINS	DRAIN01AN - DRAINS
DRMAIN01AN	DR11AN	DOORS, MAIN	DRMAIN01AN - DOORS, MAIN
DROVH01AN	DR13AN	DOOR, OVERHEAD	DROVH01AN - DOOR, OVERHEAD
DROVH02AN	DR15AN	DOOR, OVERHEAD	DROVH02AN - DOOR, OVERHEAD

CONVEY	CONVEYING SYSTEM
COR	COMMON RELIEF
CP	CONTROL PANEL
CPBO	CONTROL PANEL, BOILER
CPEL	CONTROL, ELECTRICAL
CPH	CONTROL PANEL, HOOD
CPHV	CONTROL PANEL, HVAC
CRUSH	CHRUSHER, BOTTLE
CSYS	CONTROL SYSTEM
CT	COOLING TOWER
CV	CONTROLLER
CVCMB	CONTROLLER, COMBINATION
CVDIG	CONTROLLER, DIGITAL
CVDSL	CONTROLLER, DIESEL
CVOFK	CONTROLLER, OIL FILLING/LEAK
CVP	CONTROLLER, PUMP
CVPDT	CONTROLLER, DIFFERENTIAL PRESSURE
CWASH	CAR WASH EQUIPMENT
CYL	CYLINDER
CYLH	CYLINDER, HYDRO
DA	DOOR, AUTOMATIC
DB	BARRIER, DELTA PHALANX STYLE
DC	DOOR, COILING
DCC	DOOR, COILING CONTROLS
DEC	DECODER
DF	REFRIGERATOR, FOOD DISPLAY
DG	DRAINS, STORM SEW
DH	DEHUMIDIFIER
DI	DISHWASHER
DIEX	EXHAUST, DISHWASHER
DIFU	DIFUSSER
DISIN	DISINTEGRATOR
DISP	GARBAGE DISPOSAL
DISPSR	DISPOSER
DM	DAMPER, REMOTE AI
DMAA	DAMPER, AIR ACTUATOR
DMC	DAMPER, CONTROL
DMISO	DAMPER, ISOLATION
DMOA	DAMPER, OUTSIDE AIR
DMRELF	DAMPER, RELIEF
DOOR	DOOR, GENERIC
DR	DOOR, SHUTTER
DRAIN	DRAINS
DRAINF	DRAINS, FLOOR
DRMAIN	DOORS, MAIN
DROLL	DOOR, ROLLING
DROLLC	DOOR, ROLLING CONTROL
DROLLG	DOOR, ROLLING GEARBOX
DROLLM	DOOR, ROLLING MECHANISM
DROP	DOOR, OPENER
DROVH	DOOR, OVERHEAD
DROVHM	DOOR, OVERHEAD MOTOR OPERATED
DRS	DOOR, SLIDING
DRSH	DOOR, SAFE HAVEN
DS	DISCONNECTING SWITCH
DT	TANK, DAY
DUCT	DUCTS, AIR
DUCTCO	DUCT, CO2
DUCTEQ	DUCTS, ACCESSORIES
DUCTH	DUCT, HEATER
DUCTHE	DUCT, ELECTRICT HEATER
DUSMT	DUCT, SMOKE DETECTOR
DUST	DUST COLLECTOR
DV	DOOR, VAULT
DVIN	DEVICE, INITIATING
DW	DUMB WAITER
DWBP	Drinking Water and Backflow Prevention
DX	DOOR, EXTERIOR
DY	DRYER

DRS01AN	DR19AN	DOOR, SLIDING	DRS01AN - DOOR, SLIDING
DUCTHE01AN	E-38	DUCT, ELECTRICT HEATER	DUCTHE01AN - DUCT, ELECTRICT HEATER
DUSMT01QU	AL03QU	DUCT, SMOKE DETECTOR	DUSMT01QU - DUCT, SMOKE DETECTOR
DW01QU	EL07QU	DUMBWAITER	DW01QU - DUMBWAITER
E07-2Y	E07-2Y	ELEVATOR, ELECTRIC (TRACTION SC	E07-2Y - ELEVATOR, ELECTRIC (TRACTION SCHINDLER)
E07-5Y	E07-5Y	ELEVATOR, ELECTRIC (TRACTION SC	E07-5Y - ELEVATOR, ELECTRIC (TRACTION SCHINDLER)
E07-AN	E07-AN	ELEVATOR, ELECTRIC (TRACTION SC	E07-AN - ELEVATOR, ELECTRIC (TRACTION SCHINDLER)
E07-MO	E07-MO	ELEVATOR, ELECTRIC (TRACTION SC	E07-MO - ELEVATOR, ELECTRIC (TRACTION SCHINDLER)
E15-2Y	E15-2Y	PANEL, ELECTRONIC CONTROLS	E15-2Y - PANEL, ELECTRONIC CONTROLS
E15-SA	E15-SA	PANEL, ELECTRONIC CONTROLS	E15-SA - PANEL, ELECTRONIC CONTROLS
E16-SA	E16-SA	SECURITY CAMERA GROUP	E16-SA - SECURITY CAMERA GROUP
E24-2Y	E24-2Y	CIRCUIT BREAKER (MAGNUM DS)	E24-2Y - CIRCUIT BREAKER (MAGNUM DS)
E24-AN	E24-AN	CIRCUIT BREAKER (MAGNUM DS)	E24-AN - CIRCUIT BREAKER (MAGNUM DS)
E27-2Y	E27-2Y	CKT BREAKER, LOW VOLT PWR (MAS	E27-2Y - CKT BREAKER, LOW VOLT PWR (MASTERPACT)
E27-AN	E27-AN	CKT BREAKER, LOW VOLT PWR (MAS	E27-AN - CKT BREAKER, LOW VOLT PWR (MASTERPACT)
E28-AN	E28-AN	CONTROLLER	E28-AN - CONTROLLER
E30-3Y	E30-3Y	SWITCHBOARD, 600 VOLTS AND LES	E30-3Y - SWITCHBOARD, 600 VOLTS AND LESS
E30-AN	E30-AN	SWITCHBOARD, 600 VOLTS AND LES	E30-AN - SWITCHBOARD, 600 VOLTS AND LESS
E32-AN	E32-AN	TRANSFORMER, OIL FILLED	E32-AN - TRANSFORMER, OIL FILLED
E32-SA	E32-SA	TRANSFORMER, OIL FILLED	E32-SA - TRANSFORMER, OIL FILLED
E37-3Y	E37-3Y	MOTOR CONTROL CENTER	E37-3Y - MOTOR CONTROL CENTER
E37-AN	E37-AN	MOTOR CONTROL CENTER	E37-AN - MOTOR CONTROL CENTER
E40-3Y	E40-3Y	HIGH VOLTAGE EQUIPMENT	E40-3Y - HIGH VOLTAGE EQUIPMENT
E40-AN	E40-AN	HIGH VOLTAGE EQUIPMENT	E40-AN - HIGH VOLTAGE EQUIPMENT
E43-2Y	E43-2Y	GENERATOR, EMERGENCY (CATERP	E43-2Y - GENERATOR, EMERGENCY (CATERPILLAR)
E43-3Y	E43-3Y	GENERATOR, EMERGENCY (CATERP	E43-3Y - GENERATOR, EMERGENCY (CATERPILLAR)
E43-AN	E43-AN	GENERATOR, EMERGENCY (CATERP	E43-AN - GENERATOR, EMERGENCY (CATERPILLAR)
E43-MO	E43-MO	GENERATOR, EMERGENCY (CATERP	E43-MO - GENERATOR, EMERGENCY (CATERPILLAR)
E43-QU	E43-QU	GENERATOR, EMERGENCY (CATERP	E43-QU - GENERATOR, EMERGENCY (CATERPILLAR)
E43-SA	E43-SA	GENERATOR, EMERGENCY (CATERP	E43-SA - GENERATOR, EMERGENCY (CATERPILLAR)
E43-WK	E43-WK	GENERATOR, EMERGENCY (CATERP	E43-WK - GENERATOR, EMERGENCY (CATERPILLAR)
E51-AN	E51-AN	MOTOR STARTER (LESS THAN 5 HP)	E51-AN - MOTOR STARTER (LESS THAN 5 HP)
E52-AN	E52-AN	MOTOR STARTER (5 HP TO LESS TH	E52-AN - MOTOR STARTER (5 HP TO LESS THAN 100 HP)
E57 LO	E57 LO	W VOLTAGE DRY TYPE TRANSFORME	E57 LO - W VOLTAGE DRY TYPE TRANSFORMER
E81-AN	E81-AN	UPS, ELECTRONIC	E81-AN - UPS, ELECTRONIC
E81-QU	E81-QU	UPS, ELECTRONIC	E81-QU - UPS, ELECTRONIC
E84 PA	E84 PA	NEL, POWER DISTRIBUTION	E84 PA - NEL, POWER DISTRIBUTION
E86-AN	E86-AN	SWITCH, AUTOMATIC TRANSFER	E86-AN - SWITCH, AUTOMATIC TRANSFER
E86-QU	E86-QU	SWITCH, AUTOMATIC TRANSFER	E86-QU - SWITCH, AUTOMATIC TRANSFER
E90-AN	E90-AN	LIGHTING CONTACTORS	E90-AN - LIGHTING CONTACTORS
E92-SA	E92-SA	GROUND FAULT CIRCUIT INTERRUP	E92-SA - GROUND FAULT CIRCUIT INTERRUPTOR
E94-3Y	E94-3Y	VARIABLE SPEED DRIVE (ABB)	E94-3Y - VARIABLE SPEED DRIVE (ABB)
E94-AN	E94-AN	VARIABLE SPEED DRIVE (ABB)	E94-AN - VARIABLE SPEED DRIVE (ABB)
E97-3Y	E97-3Y	VOLTAGE REGULATOR (MEDIUM VOI	E97-3Y - VOLTAGE REGULATOR (MEDIUM VOLT)
E97-SA	E97-SA	VOLTAGE REGULATOR (MEDIUM VOI	E97-SA - VOLTAGE REGULATOR (MEDIUM VOLT)
E98-AN	E98-AN	GROUND AND LIGHTNING PROTECT	E98-AN - GROUND AND LIGHTNING PROTECT (SMALL GRP)
E98-SA	E98-SA	GROUND AND LIGHTNING PROTECT	E98-SA - GROUND AND LIGHTNING PROTECT (SMALL GRP)
E99-AN	E99-AN	GROUND AND LIGHTNING PROTECT	E99-AN - GROUND AND LIGHTNING PROTECT (LARGE GRP)
E99-SA	E99-SA	GROUND AND LIGHTNING PROTECT	E99-SA - GROUND AND LIGHTNING PROTECT (LARGE GRP)
EE01AN	DR05AN	EE - EMERGENCY EXIT	EE01AN - EE - EMERGENCY EXIT
EF-7.5HP-AN	EF-7.5HP-AN	Exhaust Fan (=7.5HP) (Annual)	EF-7.5HP-AN - Exhaust Fan (=7.5HP) (Annual)
EF-7.5HP-SA	EF-7.5HP-SA	Exhaust Fan (=7.5HP) (SemiAnnual)	EF-7.5HP-SA - Exhaust Fan (=7.5HP) (SemiAnnual)
EF-SA	EF-SA	Exhaust Fan (< 7.5HP) (SemiAnnual)	EF-SA - Exhaust Fan (< 7.5HP) (SemiAnnual)
EL01MO	EL01MO	ELEVATOR	EL01MO - ELEVATOR
EL01QU	EL01QU	ELEVATOR	EL01QU - ELEVATOR
EL01SA	EL01SA	ELEVATOR	EL01SA - ELEVATOR
EL02AN	EL02AN	ELEVATOR	EL02AN - ELEVATOR
EL02M0	EL02MO	ELEVATOR	EL02M0 - ELEVATOR
EL02SA	EL02SA	ELEVATOR	EL02SA - ELEVATOR
ELHL01AN	EL01AN	ELEVATOR, HYDRAULIC	ELHL01AN - ELEVATOR, HYDRAULIC
ELV-AN	ELV-AN	Elevators (Annual)	ELV-AN - Elevators (Annual)
ELV-MO	ELV-MO	Elevators (Monthly)	ELV-MO - Elevators (Monthly)
ELV-QU	ELV-QU	Elevators (Quarterly)	ELV-QU - Elevators (Quarterly)
ELV-SA	ELV-SA	Elevators (SemiAnnual)	ELV-SA - Elevators (SemiAnnual)
ELV-WK	ELV-WK	Elevators (Weekly)	ELV-WK - Elevators (Weekly)
EPM-AN	EPM-AN	Electric Power Monitoring (Annual)	EPM-AN - Electric Power Monitoring (Annual)
EPM-MO	EPM-MO	Electric Power Monitoring (Monthly)	EPM-MO - Electric Power Monitoring (Monthly)
EPM-QU	EPM-QU	Electric Power Monitoring (Quarterly)	EPM-QU - Electric Power Monitoring (Quarterly)
EPM-SA	EPM-SA	Electric Power Monitoring (SemiAnnual)	EPM-SA - Electric Power Monitoring (SemiAnnual)

DYA	DRYER, AIR
DYG	DRYER, GAS
EA	EQUIPMENT, ATHLETIC
EC	ELEVATOR CAB
EF	FAN, EXHAUST
EG	ELEVATOR GORVENOR
EH	ELECTRIC H2O HEATER
EL	ELEVATOR
ELEC	*EXT LITE ELEC BOX (SQUARE D)
ELEQ	EQUIPMENT, ELECTRICAL
ELHL	ELEVATOR, HYDRAULIC
ELHP	ELEVATOR, HANDICAP
ELP	PANEL, ELEVATOR
ELS	ELECTRICAL SYSTEM
EM	ELECTRICAL MANHOLE
EN	ENGINE
ENDSL	ENGINE, DIESEL
ENP	ENGINE, PRESSURIZE
ENREC	*ENERGY RECOVERY (York)
EQSEC	EQUIPMENT, PACKAGE SCREENING
ES	ELECTRICAL SWITCH BOX
ESC	ESCALATOR
ESSEN	GENERATOR, DIESEL
EV	EVAPORATOR
EW	SHOWER, EMERGENCY
EXC	EXCAVATOR
EXLBBY	EXHAUST, LOBBY
EXLH	EXHAUST, LAB HOOD
EXVHCL	EXHAUST, VEHICLE
FA	FIRE ALARM SYSTEM
FAAN	ANNUNCIATOR, FIRE ALARM
FAC	FACILITY
FAF	FRESH-AIR FAN
FAFI	FRESH-AIR FAN, INDOOR
FAFO	FRESH-AIR FAN, OUTDOOR
FB	FIREPLACE
FBTF	FILL BOX, TANK, FUEL
FC	FAN COIL UNIT
FCU	FULE CONTROL UNIT
FCUACT	FUEL CONTROL UNIT, ACTUATOR
FCUTM	FUEL CONTROL UNIT, TIMER
FCUVA	FUEL CONTROL UNIT, VALVE
FD	PUMP, GASOLINE
FE	FENCING
FEBR	DOOR, FEBR
FEED	FEEDERS
FG	FIRE EXT, CO2
FGTNK	TANK, FIBERGLASS STORAGE (WATER)
FH	FIRE HOSE
FHN	FIRE HOSE NOZZLE
FHR	HOSE RACK
FHY	FIRE HYDRANT
FI	FILTERS
FIH20	FILTER, WATER
FIPRE	FILTER, PRE
FIXT	FIXTURE
FL	FILTER, WASHABLE
FLBU	FLAME BURNER
FLC	FILTER, CARTRIDGE
FLH	FILTER, HYDRAULIC
FLINE	FUEL LINE
FLMS	MONITORING SYSTEM, FUEL
FLOOR	*FLOOR TROUGH (EMJACK)
FLS	FILTER, SAND
FLS	FIRE & LIFE SAFETY
FM	DAMPER, FIRE AND SMOKE
FN	FAN
FNA	FAN, AXIAL
FNB	FAN, BOOSTER

ESC01AN	EL03AN	ESCALATOR	ESC01AN - ESCALATOR
ESC01WK	EL03WK	ESCALATOR	ESC01WK - ESCALATOR
ET-AN	ET-AN	Expansion Tank (Annual)	ET-AN - Expansion Tank (Annual)
EW01MO	EW01MO	SHOWER, EMERGENCY	EW01MO - SHOWER, EMERGENCY
EW-AN	EW-AN	Eye Washer (Annual)	EW-AN - Eye Washer (Annual)
EWC-AN	EWC-AN	Electric Water Cooler, Drinking Fountain	EWC-AN - Electric Water Cooler, Drinking Fountain (Annual)
EW-SA	EW-SA	Eye Washer (SemiAnnual)	EW-SA - Eye Washer (SemiAnnual)
EW-WK	EW-WK	Eye Washer (Weekly)	EW-WK - Eye Washer (Weekly)
F05-2Y	F05-2Y	PUMP, FIRE, ENGINE DRIVEN	F05-2Y - PUMP, FIRE, ENGINE DRIVEN
F05-AN	F05-AN	PUMP, FIRE, ENGINE DRIVEN	F05-AN - PUMP, FIRE, ENGINE DRIVEN
F05-SA	F05-SA	PUMP, FIRE, ENGINE DRIVEN	F05-SA - PUMP, FIRE, ENGINE DRIVEN
F05-WK	F05-WK	PUMP, FIRE, ENGINE DRIVEN	F05-WK - PUMP, FIRE, ENGINE DRIVEN
F09-AN	F09-AN	FIRE DEPT HOSE CONNECT (STDPIP	F09-AN - FIRE DEPT HOSE CONNECT (STDPIPE OUTLET)
F11-SA	F11-SA	FIRE/NON-FIRE DOORS AND WINDOV	F11-SA - FIRE/NON-FIRE DOORS AND WINDOWS
F19-AN	F19-AN	FIRE HYDRANT GROUP (WET BARRE	F19-AN - FIRE HYDRANT GROUP (WET BARREL)
F20-3Y	F20-3Y	SPRINKLER HEADS/STANDPIPE - SM	F20-3Y - SPRINKLER HEADS/STANDPIPE - SMALL GROUP
F20-QU	F20-QU	SPRINKLER HEADS/STANDPIPE - SM	F20-QU - SPRINKLER HEADS/STANDPIPE - SMALL GROUP
F21-3Y	F21-3Y	SPRINKLER HEADS/STANDPIPE - LAF	F21-3Y - SPRINKLER HEADS/STANDPIPE - LARGE GROUP
F21-QU	F21-QU	SPRINKLER HEADS/STANDPIPE - LAF	F21-QU - SPRINKLER HEADS/STANDPIPE - LARGE GROUP
F26-MO	F26-MO	FIRE SUPPRESSION SYSTEM, DRY C	F26-MO - FIRE SUPPRESSION SYSTEM, DRY CHEMICAL
F26-SA	F26-SA	FIRE SUPPRESSION SYSTEM, DRY C	F26-SA - FIRE SUPPRESSION SYSTEM, DRY CHEMICAL
F28-AN	F28-AN	FAN, BELT DRIVEN (7.5 HP AND LARG	F28-AN - FAN, BELT DRIVEN (7.5 HP AND LARGER)
F28-QU	F28-QU	FAN, BELT DRIVEN (7.5 HP AND LARG	F28-QU - FAN, BELT DRIVEN (7.5 HP AND LARGER)
F34-AN	F34-AN	FAN, BELT DRIVEN (LESS THAN 7.5 H	F34-AN - FAN, BELT DRIVEN (LESS THAN 7.5 HP)
F34-SA	F34-SA	FAN, BELT DRIVEN (LESS THAN 7.5 H	F34-SA - FAN, BELT DRIVEN (LESS THAN 7.5 HP)
F35-2Y	F35-2Y	FILTER BANK, CHEM-BIO	F35-2Y - FILTER BANK, CHEM-BIO
F35-AN	F35-AN	FILTER BANK, CHEM-BIO	F35-AN - FILTER BANK, CHEM-BIO
F35-QU	F35-QU	FILTER BANK, CHEM-BIO	F35-QU - FILTER BANK, CHEM-BIO
F35-SA	F35-SA	FILTER BANK, CHEM-BIO	F35-SA - FILTER BANK, CHEM-BIO
F36-AN	F36-AN	LOUVER WITH FILTER SCREEN	F36-AN - LOUVER WITH FILTER SCREEN
F39-MO	F39-MO	CAFETERIA EXHAUST HOOD	F39-MO - CAFETERIA EXHAUST HOOD
F39-SA	F39-SA	CAFETERIA EXHAUST HOOD	F39-SA - CAFETERIA EXHAUST HOOD
F41-AN	F41-AN	LIGHTNING PROTECTION	F41-AN - LIGHTNING PROTECTION
F43-AN	F43-AN	FAN, SMOKE EXHAUST	F43-AN - FAN, SMOKE EXHAUST
F43-QU	F43-QU	FAN, SMOKE EXHAUST	F43-QU - FAN, SMOKE EXHAUST
F45-AN	F45-AN	FAN, DIRECT DRIVE, FRACTIONAL HF	F45-AN - FAN, DIRECT DRIVE, FRACTIONAL HP
F46-MO	F46-MO	HOOD, BIO-SAFETY	F46-MO - HOOD, BIO-SAFETY
F46-SA	F46-SA	HOOD, BIO-SAFETY	F46-SA - HOOD, BIO-SAFETY
F49-AN	F49-AN	FACILITY AND GROUNDS	F49-AN - FACILITY AND GROUNDS
F70-5Y	F70-5Y	FIRE ALARM CONTROL PANEL	F70-5Y - FIRE ALARM CONTROL PANEL
F70-AN	F70-AN	FIRE ALARM CONTROL PANEL	F70-AN - FIRE ALARM CONTROL PANEL
F70-SA	F70-SA	FIRE ALARM CONTROL PANEL	F70-SA - FIRE ALARM CONTROL PANEL
F81-AN	F81-AN	AUTO FIRE DETECT DEV OR ALARM (	F81-AN - AUTO FIRE DETECT DEV OR ALARM (SMALL)
F81-SA	F81-SA	AUTO FIRE DETECT DEV OR ALARM (	F81-SA - AUTO FIRE DETECT DEV OR ALARM (SMALL)
F82-AN	F82-AN	AUTO FIRE DETECT DEV OR ALARM (	F82-AN - AUTO FIRE DETECT DEV OR ALARM (MEDIUM)
F82-SA	F82-SA	AUTO FIRE DETECT DEV OR ALARM (	F82-SA - AUTO FIRE DETECT DEV OR ALARM (MEDIUM)
F83-AN	F83-AN	AUTO FIRE DETECT DEV OR ALARM (	F83-AN - AUTO FIRE DETECT DEV OR ALARM (LARGE)
F83-SA	F83-SA	AUTO FIRE DETECT DEV OR ALARM (	F83-SA - AUTO FIRE DETECT DEV OR ALARM (LARGE)
F85-AN	F85-AN	FIRE EXTINGUISHER GP, SMALL	F85-AN - FIRE EXTINGUISHER GP, SMALL
F85-QU	F85-QU	FIRE EXTINGUISHER GP, SMALL	F85-QU - FIRE EXTINGUISHER GP, SMALL
F86-AN	F86-AN	FIRE EXTINGUISHER GP, MEDIUM	F86-AN - FIRE EXTINGUISHER GP, MEDIUM
F86-QU	F86-QU	FIRE EXTINGUISHER GP, MEDIUM	F86-QU - FIRE EXTINGUISHER GP, MEDIUM
F87-AN	F87-AN	FIRE EXTINGUISHER GP, LARGE	F87-AN - FIRE EXTINGUISHER GP, LARGE
F87-QU	F87-QU	FIRE EXTINGUISHER GP, LARGE	F87-QU - FIRE EXTINGUISHER GP, LARGE
F90-QU	F90-QU	VALVE, FIRE W/TAMPER SWITCH, FL	F90-QU - VALVE, FIRE W/TAMPER SWITCH, FLOW SWITCH
F91-3Y	F91-3Y	VALVE, FIRE SPRINKLER DRY (VICTA	F91-3Y - VALVE, FIRE SPRINKLER DRY (VICTAULIC)
F91-AN	F91-AN	VALVE, FIRE SPRINKLER DRY (VICTA	F91-AN - VALVE, FIRE SPRINKLER DRY (VICTAULIC)
F91-MO	F91-MO	VALVE, FIRE SPRINKLER DRY (VICTA	F91-MO - VALVE, FIRE SPRINKLER DRY (VICTAULIC)
F91-WK	F91-WK	VALVE, FIRE SPRINKLER DRY (VICTA	F91-WK - VALVE, FIRE SPRINKLER DRY (VICTAULIC)
FA01AN	AL05AN	FIRE ALARM SYSTEM	FA01AN - FIRE ALARM SYSTEM
FA01QU	F-13	FIRE ALARM SYSTEM	FA01QU - FIRE ALARM SYSTEM
FA02QU	F-14	FIRE ALARM SYSTEM	FA02QU - FIRE ALARM SYSTEM
FACP-AN	FACP-AN	Fire Alarm Control Panel (Annual)	FACP-AN - Fire Alarm Control Panel (Annual)
FACP-MO	FACP-MO	Fire Alarm Control Panel (Monthly)	FACP-MO - Fire Alarm Control Panel (Monthly)
FACP-QU	FACP-QU	Fire Alarm Control Panel (Quarterly)	FACP-QU - Fire Alarm Control Panel (Quarterly)
FACP-SA	FACP-SA	Fire Alarm Control Panel (SemiAnnual)	FACP-SA - Fire Alarm Control Panel (SemiAnnual)
FACP-WK	FACP-WK	Fire Alarm Control Panel (Weekly)	FACP-WK - Fire Alarm Control Panel (Weekly)
FB05AN	FB05AN	FIREPLACE	FB05AN - FIREPLACE
FC01AN	FC01AN	FAN COIL UNIT	FC01AN - FAN COIL UNIT

FNBL	FAN, BLEED
FNBURN	FAN, BURNER
FNC	FAN, CENTRIFUGAL
FNE	FAN, EXTRACTOR
FNF	FAN, FLORAL
FNH	FAN, HEATER
FNI	FAN, INJECTOR
FNINJ	FAN, INJECTOR
FNM	FAN, MOTOR
FNMU	FAN, MAKE-UP
FNP	FAN, PRESSURIZE
FNR	FAN, RETURN AIR
FNS	FAN, SUPPLY
FNST	FAN, STANDING
FNW	FAN, WALL
FNWW	FAN, WALL MOUNT
FO	FOUNTAIN
FOBC	FOUNTAIN, CHEMICALS
FOOD	Equipment, Food Dispensing
FOP	FOUNTAIN, PLUMBING
FP	PUMP, FIRE
FPDE	PUMP, DIESEL ENGINE FIRE
FQ	FIRE EQUIPMENT (GENERIC)
FRYER	FRYER, ELECTRIC
FRYERB	FRYER, BATTERY
FS	FIRE SPRINKLER
FSC	FIRE (CHEMICAL) SUPPRESION SYSTEM
FSS	FIRE SUPPRESSION SYSTEM
FT	TANK, FUEL
FU	FUSE
FUEL-D	TANK, DOUBLE WALL DAY
FURN	FURNACE
FURNA	FURNACE, AIR
FV	STANDPIPE, FIRE SUPPRESSION SYSTEM
FW	FIRE EXT, WATER
FX	FIRE EXT, DRY
FY	FIRE SAFETY
FZ	FREEZER
GACF	FILTER, GRANULAR ACTIVATED CARBON
GAR	EQUIPMENT, GARAGE
GASC	CHAMBER, GAS
GASP	PIPING, GAS
GASR	REGULATOR, GAS
GATE	GATES, MISCELLANEOUS
GATEA	GATE, AUTOMATIC
GATEEE	GATE, ELECTRIC
GATEL	GATE, LINER
GATER	GATE, ROLLING
GATES	GATE, SLIDING
GATEV	GATE, GO/ VEHICLULAR
GAUGE	GAUGE
GCOMP	COMPONENT, GENERIC
GD	DISPENSER, GASOLINE
GDD	DISPENSER, DIESEL GAS
GE	EQUIPMENT, GARDEN
GG	GRILL,GAS COOKING
GL	GRIDDLE
GN	GENERATOR
GNEM	GENERATOR, EMERGENCY
GNHW	GENERATOR, HOT WATER
GNUT	GENERATOR, UTILITY
GO	GATE OPENER
GR	GROUNDING SYSTEM
GT	GATOR
GW	GRINDER (SEWAGE TRMT)
GY	EQUIPMENT, GYM/FITNESS
GY	EQUIPMENT, GYM/FITNESS
HA	HEATERS, AIR
HACC	ACCUMULATOR, HYDRAULIC

FC01MO	FD01MO	PUMP, GASOLINE	FC01MO - PUMP, GASOLINE
FC01QU	FC01QU	FAN COIL UNIT	FC01QU - FAN COIL UNIT
FCU-AN	FCU-AN	Fan Coil Unit (Annual)	FCU-AN - Fan Coil Unit (Annual)
FCU-QU	FCU-QU	Fan Coil Unit (Quarterly)	FCU-QU - Fan Coil Unit (Quarterly)
FCU-SA	FCU-SA	Fan Coil Unit (SemiAnnual)	FCU-SA - Fan Coil Unit (SemiAnnual)
FD01SA	FD01SA	PUMP, GASOLINE	FD01SA - PUMP, GASOLINE
FG01AN	F-21	FIRE EXT, CO2	FG01AN - FIRE EXT, CO2
FG01AN	F-25	FIRE EXT, CO2	FG01AN - FIRE EXT, CO2
FG01MO	F-24	FIRE EXT, CO2	FG01MO - FIRE EXT, CO2
FG01SA	F-26	FIRE EXT, CO2	FG01SA - FIRE EXT, CO2
FH01AN	FH01AN	FIRE HOSE	FH01AN - FIRE HOSE
FHY01AN	F-19	FIRE HYDRANT	FHY01AN - FIRE HYDRANT
FI01AN	F-34	FILTER	FI01AN - FILTER
FI01MO	F-31	FILTER	FI01MO - FILTER
FI01QU	F-32	FILTER	FI01QU - FILTER
FI02AN	F-35	FILTER	FI02AN - FILTER
FL01QU	FL01QU	FILTER, WASHABLE	FL01QU - FILTER, WASHABLE
FLS01QU	AL07QU	FIRE & LIFE SAFETY	FLS01QU - FIRE & LIFE SAFETY
FM01AN	FM01AN	DAMPER, FIRE AND SMOKE	FM01AN - DAMPER, FIRE AND SMOKE
FNC01AN	F-27	FAN, CENTRIFUGAL	FNC01AN - FAN, CENTRIFUGAL
FOS-AN	FOS-AN	Fuel Oil System (Annual)	FOS-AN - Fuel Oil System (Annual)
FOS-SA	FOS-SA	Fuel Oil System (SemiAnnual)	FOS-SA - Fuel Oil System (SemiAnnual)
FOS-WK	FOS-WK	Fuel Oil System (Weekly)	FOS-WK - Fuel Oil System (Weekly)
FP01AN	F-05	PUMP, FIRE	FP01AN - PUMP, FIRE
FP01MO	F-06	PUMP, FIRE	FP01MO - PUMP, FIRE
FP02AN	F-07	PUMP, FIRE	FP02AN - PUMP, FIRE
FPA-AN	FPA-AN	Fire Pump Assembly (Annual)	FPA-AN - Fire Pump Assembly (Annual)
FS01SA	F-20	FIRE SPRINKLER	FS01SA - FIRE SPRINKLER
FSPNKLW-AN	FSPNKLW-AN	Fire Sprinkler System, Wet (Annual)	FSPNKLW-AN - Fire Sprinkler System, Wet (Annual)
FSPNKLW-MO	FSPNKLW-MO	Fire Sprinkler System, Wet (Monthly)	FSPNKLW-MO - Fire Sprinkler System, Wet (Monthly)
FSPNKLW-QU	FSPNKLW-QU	Fire Sprinkler System, Wet (Quarterly)	FSPNKLW-QU - Fire Sprinkler System, Wet (Quarterly)
FSPNKLW-SA	FSPNKLW-SA	Fire Sprinkler System, Wet (SemiAnnual)	FSPNKLW-SA - Fire Sprinkler System, Wet (SemiAnnual)
FSPNKLW-WK	FSPNKLW-WK	Fire Sprinkler System, Wet (Weekly)	FSPNKLW-WK - Fire Sprinkler System, Wet (Weekly)
FSPRNKLD-AN	FSPRNKLD-AN	Fire Sprinkler System, Dry (Annual)	FSPRNKLD-AN - Fire Sprinkler System, Dry (Annual)
FSPRNKLD-SA	FSPRNKLD-SA	Fire Sprinkler System, Dry (SemiAnnual)	FSPRNKLD-SA - Fire Sprinkler System, Dry (SemiAnnual)
FSPRNKLD-WK	FSPRNKLD-WK	Fire Sprinkler System, Dry (Weekly)	FSPRNKLD-WK - Fire Sprinkler System, Dry (Weekly)
FSS01AN	F-03	FIRE SUPPRESSION SYSTEM	FSS01AN - FIRE SUPPRESSION SYSTEM
FSS01SA	F-01	FIRE SUPPRESSION SYSTEM	FSS01SA - FIRE SUPPRESSION SYSTEM
FSS02AN	F-04	FIRE SUPPRESSION SYSTEM	FSS02AN - FIRE SUPPRESSION SYSTEM
FURN01AN	FI01AN	FURNACE	FURN01AN - FURNACE
FV03AN	FV03AN	STANDPIPE, FIRE SUPPRESSION SY	FV03AN - STANDPIPE, FIRE SUPPRESSION SY
FW01AN	F-22	FIRE EXT, WATER	FW01AN - FIRE EXT, WATER
FX01AN	F-23	FIRE EXT, DRY	FX01AN - FIRE EXT, DRY
G02-MO	G02-MO	GREASE TRAPS	G02-MO - GREASE TRAPS
G05-QU	G05-QU	SECURITY GATES AND DOORS, MAN	G05-QU - SECURITY GATES AND DOORS, MANUAL
G06-QU	G06-QU	FUEL OIL FILL PORTS AND TRANSITI	G06-QU - FUEL OIL FILL PORTS AND TRANSITION SUMPS
GATE01AN	GT01AN	GATES, MISCELLANEOUS	GATE01AN - GATES, MISCELLANEOUS
GATE01SA	GT01SA	GATES, MISCELLANEOUS	GATE01SA - GATES, MISCELLANEOUS
GATEV02AN	GATE05AN	GATE, GO/VEHICULAR	GATEV02AN - GATE, GO/VEHICULAR
GATEV02SA	GATE05SA	GATE, GO/VEHICULAR	GATEV02SA - GATE, GO/VEHICULAR
GATEV03AN	GATES05AN	GATE, GO/VEHICULAR	GATEV03AN - GATE, GO/VEHICULAR
GATEV03MO	GT03	GATE, GO/VEHICULAR	GATEV03MO - GATE, GO/VEHICULAR
GATEV03SA	GATES05SA	GATE, GO/VEHICULAR	GATEV03SA - GATE, GO/VEHICULAR
GE01SA	L-01	EQUIPMENT, GARDEN	GE01SA - EQUIPMENT, GARDEN
GEN-AN	GEN-AN	Generators (Annual)	GEN-AN - Generators (Annual)
GEN-MO	GEN-MO	Generators (Monthly)	GEN-MO - Generators (Monthly)
GEN-QU	GEN-QU	Generators (Quarterly)	GEN-QU - Generators (Quarterly)
GEN-SA	GEN-SA	Generators (SemiAnnual)	GEN-SA - Generators (SemiAnnual)
GEN-WK	GEN-WK	Generators (Weekly)	GEN-WK - Generators (Weekly)
GM-AN	GM-AN	Gas Meter (Annual)	GM-AN - Gas Meter (Annual)
GM-WK	GM-WK	Gas Meter (Weekly)	GM-WK - Gas Meter (Weekly)
GN01??	E-43	GENERATOR	GN01?? - GENERATOR
GN012Y	GS012Y	GENERATOR	GN012Y - GENERATOR
GN01AN	GS01AN	GENERATOR	GN01AN - GENERATOR
GN01MO	GS01MO	GENERATOR	GN01MO - GENERATOR
GN01SA	GS01SA	GENERATOR	GN01SA - GENERATOR
GN01WK	GS01WK	GENERATOR	GN01WK - GENERATOR
GN02??	E-44	GENERATOR	GN02?? - GENERATOR
GN052Y	GS052Y	GENERATOR	GN052Y - GENERATOR

HB	BARRIER, HYDRAULIC
HC	HEATER, ELECTRIC
HD	HUMIDIFIER
HDDXU	HUMIDIFIER, DIRECT EXPANSION
HE	HEATERS
HEBO	HEATER, BOOSTER
HEC	HEATER, CABINET UNIT
HEDE	DETECTOR, HEAT
HEDUCT	HEATER, DUCT
HG	HEATING
HHSA	HYDRONIC HEATING SYSTEM, AQUASTAT
HINGE	HINGES
HL	LIFT, HYDRAULIC
HM	HUMIDIFICATION SYSTEM
HOOD	HOOD, RELIEF
HOODC	HOOD, CONDENSATION
HOODG	HOOD, GRAVITY PRESSURE SYSTEM
HOODK	HOOD, KITCHEN
HP	PUMP, HEAT
HR	PUMP, HYDRONIC
HRU	HEAT RECOVERY UNIT
HT	ROOF, HATCH
HTRACE	HEAT TRACING
HVAC	HVAC, MISC
HVACC	HVAC, CENTRAL COMPUTER
HVACG	HVAC, AIR INTAKE GRILLE
HW	PUMP, HOT WATER
HWS	SYSTEM, HOT WATER
HWU	URN, HOTY WATER
HX	HEAT EXCHANGER
HY	Hydraulic Power Systems
HYDRO	HYDRO KIT
HYHP	SYSTEM, HYDRO-PNEUMATYC
IL	LIGHTS, EMERGENCY
IM	ICE MAKER
IN	INCINERATOR
INSP	INSPECTION, GENERIC
INSP-H	INSPECTION, HAZARD
ION	ION UNIT
IS	INTERCOMM. SYSTEM
ITM	MACHINE, INNER TUBE
JP	PUMP, JOCKEY
JT	CRAWL SPACE & ACCESS PANELS
KATTL	SELF CONTAINED KATTL
KI	EQUIPMENT, KITCHEN
LAVTRY	LAVATORY
LB	LOAD BANKS
LCC	*LOGIC CONTROL (No Manufacturer)
LE	LIGHTS, EXTERIOR
LEVEL	LEVELLER, DOCK
LF	LIFT
LFELEV	LIFTM ELEVATING DOCK
LFHP	LIFT, HANDICAP
LFSC	LIFT, SCISSORT
LG	LIGHTS, GENERIC/INTERIOR
LI	IRRIGATION, LAND
LIPRO	LIGHTNING PROTECTION
LIQUIT	PUMP, VOLUME CONTROL
LKDE	DETECTOR, LEAK
LM	LAWNMOWER
LO	EQUIPMENT, LOADING
LOCK	LOCK, MISCELLANEOUS
LOCK-G	LOCK, GATE
LOCN	LOAD CENTRE
LOOP	SAFETY LOOP DETECTOR
LOUVER	LOUVER
LSFSC	LIFT, FLOATING SWITCH STATION
LST	LIFT STATION
LSTW	LIFT STATION, SEWAGE & WASTE

GN05AN	GS05AN	GENERATOR	GN05AN - GENERATOR
GN05MO	GS05MO	GENERATOR	GN05MO - GENERATOR
GN05SA	GS05SA	GENERATOR	GN05SA - GENERATOR
GN05WK	GS05WK	GENERATOR	GN05WK - GENERATOR
GN092Y	GS092Y	GENERATOR	GN092Y - GENERATOR
GN09AN	GS09AN	GENERATOR	GN09AN - GENERATOR
GN09MO	GS09MO	GENERATOR	GN09MO - GENERATOR
GN09SA	GS09SA	GENERATOR	GN09SA - GENERATOR
GN09WK	GS09WK	GENERATOR	GN09WK - GENERATOR
GN112Y	GS112Y	GENERATOR	GN112Y - GENERATOR
GN11AN	GS11AN	GENERATOR	GN11AN - GENERATOR
GN11MO	GS11MO	GENERATOR	GN11MO - GENERATOR
GN11SA	GS11SA	GENERATOR	GN11SA - GENERATOR
GN11WK	GS11WK	GENERATOR	GN11WK - GENERATOR
GN192Y	GS192Y	GENERATOR	GN192Y - GENERATOR
GN19MO	GS19MO	GENERATOR	GN19MO - GENERATOR
GN19SA	GS19SA	GENERATOR	GN19SA - GENERATOR
GN19WK	GS19WK	GENERATOR	GN19WK - GENERATOR
GNEM01AN	E-42	GENERATOR, EMERGENCY	GNEM01AN - GENERATOR, EMERGENCY
GNxxAN	GS19AN	GENERATOR	GNxxAN - GENERATOR
GNxxAN	CK-E61H	GENERATOR	GNxxAN - GENERATOR
GTRAP-AN	GTRAP-AN	Grease Trap (Annual)	GTRAP-AN - Grease Trap (Annual)
GTRAP-QU	GTRAP-QU	Grease Trap (Quarterly)	GTRAP-QU - Grease Trap (Quarterly)
GTRAP-SA	GTRAP-SA	Grease Trap (SemiAnnual)	GTRAP-SA - Grease Trap (SemiAnnual)
H03-AN	H03-AN	HOT WATER HEATER, ELECTRIC	H03-AN - HOT WATER HEATER, ELECTRIC
H06-AN	H06-AN	UNIT HEATER, HOT WATER	H06-AN - UNIT HEATER, HOT WATER
H07-AN	H07-AN	SNOW MELT SYSTEM (DELTA THERM	H07-AN - SNOW MELT SYSTEM (DELTA THERM)
H16-AN	H16-AN	HEAT EXCHANGER	H16-AN - HEAT EXCHANGER
H16-SA	H16-SA	HEAT EXCHANGER	H16-SA - HEAT EXCHANGER
HB01AN	GT05AN	BARRIER, HYDRAULIC	HB01AN - BARRIER, HYDRAULIC
HB01SA	GT05SA	BARRIER, HYDRAULIC	HB01SA - BARRIER, HYDRAULIC
HD01SA	HD01SA	HUMIDIFIER	HD01SA - HUMIDIFIER
HM01AN	HM01AN	HUMIDIFICATION SYSTEM	HM01AN - HUMIDIFICATION SYSTEM
HP01QU	AC01QU	PUMP, HEAT	HP01QU - PUMP, HEAT
HT01AN	DR01AN	ROOF, HATCH	HT01AN - ROOF, HATCH
HT01SA	DR01SA	ROOF, HATCH	HT01SA - ROOF, HATCH
HWB-AN	HWB-AN	Hot Water Boiler, Gas (Annual)	HWB-AN - Hot Water Boiler, Gas (Annual)
HWB-QU	HWB-QU	Hot Water Boiler, Gas (Quarterly)	HWB-QU - Hot Water Boiler, Gas (Quarterly)
HWB-SA	HWB-SA	Hot Water Boiler, Gas (SemiAnnual)	HWB-SA - Hot Water Boiler, Gas (SemiAnnual)
HWB-WK	HWB-WK	Hot Water Boiler, Gas (Weekly)	HWB-WK - Hot Water Boiler, Gas (Weekly)
HWS01AN	H-01	SYSTEM, HOT WATER	HWS01AN - SYSTEM, HOT WATER
HWS02AN	H-03	SYSTEM, HOT WATER	HWS02AN - SYSTEM, HOT WATER
HX01AN	HE01AN	HEAT EXCHANGER	HX01AN - HEAT EXCHANGER
I05-AN	I05-AN	FAN COIL UNIT (CEILING MOUNTED)	I05-AN - FAN COIL UNIT (CEILING MOUNTED)
I05-QU	I05-QU	FAN COIL UNIT (CEILING MOUNTED)	I05-QU - FAN COIL UNIT (CEILING MOUNTED)
I07-AN	I07-AN	FAN COIL UNIT (LIEBERT XDO AND X	I07-AN - FAN COIL UNIT (LIEBERT XDO AND XDPI)
I07-QU	I07-QU	FAN COIL UNIT (LIEBERT XDO AND X	I07-QU - FAN COIL UNIT (LIEBERT XDO AND XDPI)
IL01QU	LF03QU	LIGHTS, EMERGENCY	IL01QU - LIGHTS, EMERGENCY
IN01AN	I-01	INCINERATOR	IN01AN - INCINERATOR
INSP03SA	RO03SA	INSPECTION, GENERIC	INSP03SA - INSPECTION, GENERIC
IRRS-AN	IRRS-AN	Irrigation System (Annual)	IRRS-AN - Irrigation System (Annual)
IRRS-MO	IRRS-MO	Irrigation System (Monthly)	IRRS-MO - Irrigation System (Monthly)
IRRS-SA	IRRS-SA	Irrigation System (SemiAnnual)	IRRS-SA - Irrigation System (SemiAnnual)
JP01AN	PO05AN	PUMP, JOCKEY	JP01AN - PUMP, JOCKEY
JP01SA	PO05SA	PUMP, JOCKEY	JP01SA - PUMP, JOCKEY
K03-MO	K03-MO	CUBE ICE, ICEMAKER	K03-MO - CUBE ICE, ICEMAKER
K03-SA	K03-SA	CUBE ICE, ICEMAKER	K03-SA - CUBE ICE, ICEMAKER
K20-SA	K20-SA	DISHWASHER	K20-SA - DISHWASHER
KH-SA	KH-SA	Kitchen Hood (SemiAnnual)	KH-SA - Kitchen Hood (SemiAnnual)
KH-WK	KH-WK	Kitchen Hood (Weekly)	KH-WK - Kitchen Hood (Weekly)
L04-MO	L04-MO	LIGHT FIXTURE, EXTERIOR GROUP	L04-MO - LIGHT FIXTURE, EXTERIOR GROUP
L04-SA	L04-SA	LIGHT FIXTURE, EXTERIOR GROUP	L04-SA - LIGHT FIXTURE, EXTERIOR GROUP
L05-AN	L05-AN	LIGHT FIXTURE, EXTERIOR POLE MO	L05-AN - LIGHT FIXTURE, EXTERIOR POLE MOUNTED
L10-AN	L10-AN	LIGHT FIXTURE GROUP, INTERIOR (S	L10-AN - LIGHT FIXTURE GROUP, INTERIOR (SMALL)
L11-AN	L11-AN	LIGHTING FIXTURE GROUP, INTERIO	L11-AN - LIGHTING FIXTURE GROUP, INTERIOR (LARGE)
L70-MO	L70-MO	EMERGENCY LIGHTING FIXTURE GR	L70-MO - EMERGENCY LIGHTING FIXTURE GROUP (SMALL)
L71-MO	L71-MO	EMERGENCY LIGHTING FIXTURE GR	L71-MO - EMERGENCY LIGHTING FIXTURE GROUP (LARGE)
LB-AN	LB-AN	Load Bank (Annual)	LB-AN - Load Bank (Annual)
LB-SA	LB-SA	Load Bank (SemiAnnual)	LB-SA - Load Bank (SemiAnnual)

LX	LIGHT, EXIT SIGN
MAIL	MAIL SCREENING & EQUIPMENT
MAINED	SWITCHGEAR, VOLTAGE
MAINT	MAINTENANCE, GENERAL
MCC	Motor-Control Centers
MCF	MOTOR CONTROLLER, FUSED
MCLEAN	MOTOR CLEANER
MD	EQUIPMENT, MEDICAL
MDT	METAL DETECTOR
ME	MOTOR, ELECTRIC
MELTT	TAPE, ICE MELT
MGATE	GATE MOTOR
MGS	MOTOR GENERATOR SET
MH	MANHOLE
MIND	MOTOR, INDUSTRIAL
MISC	MISCELLANEOUS
MISC-G	MISCELLANEOUS SUPPLIES, GARAGE
MNF	MOTOR, NON-FUSE
MNFDHE	MANIFOLD, HEATING
MONRE	MONITOR, REFRIGERATOR
MP	TURNSTILE
MPUMP	MOTOR, PUMP
MS	MOTOR STARTER
MSGQ	*MSGQ EQUIPMENT
MT	METER, GENERIC
MTF	METER, FLOW
MTG	METER, GAS
MTP	METER, PUMPS
MTW	METER, WATER
MVA	VALVE, MOTOR OPERATED
MW	MICROWAVE OVEN
MX	MIXER
MXT	TABLE, MIXER
MXV	VALVE, MIXING
NETHV	NETWORK, HIGH-VOLTAGE
NGR	RESISTOR
OFF	EQUIPMENT, OFFICE
OP	PUMP, OIL
OSMO	REVERSE OSMOSIS
OTEQ	EQUIPMENT, OTHER
OTHER	MACHINE, OTHER
OV	OVEN
OVS	SHELVING UNIT, SPECIALTY
PA	PANEL, FIRE ALARM
PAB	PANEL, BREAKER
PABURN	PANEL, BURNER
PACC	ACCUMULATOR, PISTON
PAD	PANEL, POWER DISTRI
PADDLE	PADDLE WHEEL
PAEL	PANEL, ELECTRICAL
PAFUEL	PANEL, FUEL CONTRO;
PAGAP	PANEL, GEN AUXILIARY POWER
PAHT	PANEL, H.T.
PAI	PUMP, AIR
PALI	PANEL, LIGHTNING
PAM	PANEL, MAIN DISTRIB
PAVE	PAVEMENT
PAWELL	PANEL, WELL CONTROL
PB	PANELBOARD
PBO	PUMP, BOILER
PBW	PUMP, BACKWASH
PCEN	PUMP, CENTRIFGAL
PCHLO	PUMP, CHLORINATOR
PCHW	PRIMARY CONDENSER HOT WATER
PCV	PUMP, CONDENSATE, OR VACUUM
PD	PUMP, DUPLEX
PDOZ	PUMP, DOZING
PE	PER PROTECTION EQUIP
PEL	PUMP, ELEVATOR

LB-WK	LB-WK	Load Bank (Weekly)	LB-WK - Load Bank (Weekly)
LE01AN	L-04	LIGHTS, EXTERIOR	LE01AN - LIGHTS, EXTERIOR
LFELEV01QA	L-02	LIFTM ELEVATING DOCK	LFELEV01QA - LIFTM ELEVATING DOCK
LG012Y	F-37	LIGHTS, GENERIC/INTERIOR	LG012Y - LIGHTS, GENERIC/INTERIOR
LG013Y	CV093Y	LIGHTS, GENERIC/INTERIOR	LG013Y - LIGHTS, GENERIC/INTERIOR
LG015Y	F-38	LIGHTS, GENERIC/INTERIOR	LG015Y - LIGHTS, GENERIC/INTERIOR
LG01AN	L-03	LIGHTS, GENERIC/INTERIOR	LG01AN - LIGHTS, GENERIC/INTERIOR
LI01AN	L-06	IRRIGATION, LAND	LI01AN - IRRIGATION, LAND
LIGHTN-AN	LIGHTN-AN	Lightning Protection (Includes Grounding	LIGHTN-AN - Lightning Protection (Includes Grounding) (Annual)
LIPRO01AN	F-41	LIGHTNING PROTECTION	LIPRO01AN - LIGHTNING PROTECTION
M01-SA	M01-SA	MANHOLES, ELEC, COMM, FIRE, WAT	M01-SA - MANHOLES, ELEC, COMM, FIRE, WATER
M05-QU	M05-QU	MANHOLES AND CULVERTS, STORM	M05-QU - MANHOLES AND CULVERTS, STORM
M30-AN	M30-AN	PRESSURE REGULATOR (NATURAL (	M30-AN - PRESSURE REGULATOR (NATURAL GAS)
ME01AN	ME01AN	MOTOR, ELECTRIC	ME01AN - MOTOR, ELECTRIC
MH01AN	MH01AN	MANHOLE	MH01AN - MANHOLE
MH03AN	MH03AN	MANHOLE	MH03AN - MANHOLE
MH05AN	MH05AN	MANHOLE	MH05AN - MANHOLE
MP03SA	MP03SA	TURNSTILE	MP03SA - TURNSTILE
MS03AN	MS03AN	MOTOR STARTER	MS03AN - MOTOR STARTER
MS05AN	MS05AN	MOTOR STARTER	MS05AN - MOTOR STARTER
MTS-AN	MTS-AN	Manual Transfer Switch (MTS) (Annual)	MTS-AN - Manual Transfer Switch (MTS) (Annual)
MTS-MO	MTS-MO	Manual Transfer Switch (MTS) (Monthly)	MTS-MO - Manual Transfer Switch (MTS) (Monthly)
MTS-QU	MTS-QU	Manual Transfer Switch (MTS) (Quarterly	MTS-QU - Manual Transfer Switch (MTS) (Quarterly)
MTS-SA	MTS-SA	Manual Transfer Switch (MTS) (SemiAnn	MTS-SA - Manual Transfer Switch (MTS) (SemiAnnual)
MTW01MO	W-04	METER, WATER	MTW01MO - METER, WATER
MVA01AN	V-07	VALVE, MOTOR OPERATED	MVA01AN - VALVE, MOTOR OPERATED
MVT-AN	MVT-AN	Transformer, Medium Voltage (Annual)	MVT-AN - Transformer, Medium Voltage (Annual)
MVT-QU	MVT-QU	Transformer, Medium Voltage (Quarterly)	MVT-QU - Transformer, Medium Voltage (Quarterly)
MVT-SA	MVT-SA	Transformer, Medium Voltage (SemiAnn	MVT-SA - Transformer, Medium Voltage (SemiAnnual)
NSLC-AN	NSLC-AN	Site Lighting Control (Annual)	NSLC-AN - Site Lighting Control (Annual)
OFF01AN	P-01.xml	EQUIPMENT, OFFICE	OFF01AN - EQUIPMENT, OFFICE
OTEQ01AN	T-05	EQUIPMENT, OTHER	OTEQ01AN - EQUIPMENT, OTHER
P04-AN	P04-AN	PUMP, CENTRIFUGAL	P04-AN - PUMP, CENTRIFUGAL
P04-SA	P04-SA	PUMP, CENTRIFUGAL	P04-SA - PUMP, CENTRIFUGAL
P07-AN	P07-AN	PUMP, FUEL (SUBMERGED)	P07-AN - PUMP, FUEL (SUBMERGED)
P09-SA	P09-SA	PUMP, CIRCULATING (FRACTIONAL H	P09-SA - PUMP, CIRCULATING (FRACTIONAL HP)
P12-AN	P12-AN	FUEL / NATURAL GAS DISTRIBUTION	P12-AN - FUEL / NATURAL GAS DISTRIBUTION SYSTEMS
P14-AN	P14-AN	DISPENSER, FUEL	P14-AN - DISPENSER, FUEL
P14-QU	P14-QU	DISPENSER, FUEL	P14-QU - DISPENSER, FUEL
P14-SA	P14-SA	DISPENSER, FUEL	P14-SA - DISPENSER, FUEL
P14-WK	P14-WK	DISPENSER, FUEL	P14-WK - DISPENSER, FUEL
P15-2Y	P15-2Y	PUMP, MOTOR OPERATED, RECIRC <	P15-2Y - PUMP, MOTOR OPERATED, RECIRC <7.5 HP
P15-AN	P15-AN	PUMP, MOTOR OPERATED, RECIRC <	P15-AN - PUMP, MOTOR OPERATED, RECIRC <7.5 HP
P50-AN	P50-AN	GLYCOL MIXING TANK	P50-AN - GLYCOL MIXING TANK
P50-QU	P50-QU	GLYCOL MIXING TANK	P50-QU - GLYCOL MIXING TANK
P50-SA	P50-SA	GLYCOL MIXING TANK	P50-SA - GLYCOL MIXING TANK
PA01QU	F-17	PANEL, FIRE ALARM	PA01QU - PANEL, FIRE ALARM
PA01QU	AL15QU	PANEL, FIRE ALARM	PA01QU - PANEL, FIRE ALARM
PAD01AN	ES07AN	PANEL, POWER DISTRI	PAD01AN - PANEL, POWER DISTRI
PB-SA	PB-SA	Paint Booth (SemiAnnual)	PB-SA - Paint Booth (SemiAnnual)
PCEN01AN	PO01AN	PUMP, CENTRIFUGAL	PCEN01AN - PUMP, CENTRIFUGAL
PCEN01SA	PO01SA	PUMP, CENTRIFUGAL	PCEN01SA - PUMP, CENTRIFUGAL
PCV01AN	PO03AN	PUMP, CONDENSATE, OR VACUUM	PCV01AN - PUMP, CONDENSATE, OR VACUUM
PJ01AN	S-02	PUMP, SEWAGE EJECTOR	PJ01AN - PUMP, SEWAGE EJECTOR
PNEU-AN	PNEU-AN	Pneumacator TMS 3000 (Annual)	PNEU-AN - Pneumacator TMS 3000 (Annual)
PNEU-QU	PNEU-QU	Pneumacator TMS 3000 (Quarterly)	PNEU-QU - Pneumacator TMS 3000 (Quarterly)
PNEU-SA	PNEU-SA	Pneumacator TMS 3000 (SemiAnnual)	PNEU-SA - Pneumacator TMS 3000 (SemiAnnual)
PNLB-AN	PNLB-AN	Panelboard (Annual)	PNLB-AN - Panelboard (Annual)
POOL-AN	POOL-AN	Pool Equipment (Annual)	POOL-AN - Pool Equipment (Annual)
POOL-MO	POOL-MO	Pool Equipment (Monthly)	POOL-MO - Pool Equipment (Monthly)
POOL-QU	POOL-QU	Pool Equipment (Quarterly)	POOL-QU - Pool Equipment (Quarterly)
POOL-SA	POOL-SA	Pool Equipment (SemiAnnual)	POOL-SA - Pool Equipment (SemiAnnual)
POOL-WK	POOL-WK	Pool Equipment (Weekly)	POOL-WK - Pool Equipment (Weekly)
R10-AN	R10-AN	VAV INSPECTION	R10-AN - VAV INSPECTION
R11-SA	R11-SA	VAV WITH HW HEAT	R11-SA - VAV WITH HW HEAT
R12-AN	R12-AN	VAV WITH ELEC HEAT	R12-AN - VAV WITH ELEC HEAT
R61-SA	R61-SA	ROOF INSPECTION (5000 SF OR LESS	R61-SA - ROOF INSPECTION (5000 SF OR LESS)
R62-SA	R62-SA	ROOF INSPECTION (5000 TO 25000 S	R62-SA - ROOF INSPECTION (5000 TO 25000 SF)
RCP-AN	RCP-AN	Recirculation Pump (Annual)	RCP-AN - Recirculation Pump (Annual)

PEST	MANAGEMENT, PEST
PF	PUMP, FUEL
PFAB	PREFAB BOOTH
PFDT	PUMP, DIESEL FUEL TRANSFER
PFILT	PUMP, FILTER
PFLOOD	PUMP, FLOOD
PFLOW	PUMP, FLOW
PFO	PUMP, FOUNTAIN
PG	EQUIPMENT, PLAYGROUND
PH	PUMP, HAZARDOUS MATE
PHH	PUMP, HIGH-PRESSURE
PHOTO	PHOTO DETECTOR
PHOUSE	POOL HOUSE
PHVAC	PUMP, HVAC
PI	PUMP, IRRIGATION
PJ	PUMP, SEWAGE EJECTOR
PLAN	TOOL, POWER ELECTRIC PLANER
PLEAD	PUMP, LEADER
PLF	PUMP, LIFT
PLFS	PUMP, LIFT STATION
PLH	PUMP, HOUSE
PLUMB	PLUMBING, GENERIC
PM	PUMP, CHEMICAL
PMT	PUMP, TOILET
PNEUM	TANK MANAGEMENT SYSTEM
PO	PUMP
POLE	POLE
POND	POND EQUIPMENT
PO-WG	PUMP, WATER GLYCOL
PP	PUMP, POOL
PP	PUMP, POOL
PPF	PANEL, POWER FACTOR
PR	PUMP, RECIRCULATING
PRA	PANEL, REMOTE ANNCIATOR
PRESS	PRESS
PRH	PUMP, HEATING CIRCULATING
PS	POWER SUPPLY
PS	PUMP, WASTE WATER
PSCAL	PUMP, ANTISCALANT
PSO	panel, solar
PSUB	PUMP, SUBMERSIBLE
PU	PUMP, SUCTION
PUHCL	PUMP, Hypochlorite
PUTUL	PUMP, TRUCK UNLOADING
PW	POWER WASHER
PWB	POWER BREAKER
PWCON	POWER CONDITIONER
PWCU	POWER COMMAND UNIT
PWF	POWER FACTOR
PWM	POWER MONITORING
PWTFAN	POWER TERMINAL, FAN
PWW	PUMP, WATER WELL
PX	FIXTURE, PLUMBING
PXE	FIXTURE, PLUMBING EXTERNAL
RA	RANGE
RACE	RACE FLOOR
RAG	RANGE, GAS
RAH	RANGE, HOOD
RD	RADIATOR
RDFIN	RADIATOR, FIN-TUBED
RE	REFRIGERATOR
RELAY	RELAY
RELAY	RELAY, VOLTAGE
RES	EQUIPMENT, HOUSE/Residential
RGH	RAMPS GROUND HEATING
RINSE	PRE-RINSE UNIT
RO	ROOF
ROD	ROOF, DRAIN
ROH	ROOF, HOIST

RCP-SA	RCP-SA	Recirculation Pump (SemiAnnual)	RCP-SA - Recirculation Pump (SemiAnnual)
RD015Y	R-01	RADIATOR	RD015Y - RADIATOR
RELAY01AN	E-20	RELAY	RELAY01AN - RELAY
RELAY02AN	E-22	RELAY	RELAY02AN - RELAY
RELAY03AN	E-23	RELAY	RELAY03AN - RELAY
RG-AN	RG-AN	Rolling Gate (Annual)	RG-AN - Rolling Gate (Annual)
RG-MO	RG-MO	Rolling Gate (Monthly)	RG-MO - Rolling Gate (Monthly)
RG-QU	RG-QU	Rolling Gate (Quarterly)	RG-QU - Rolling Gate (Quarterly)
RMS-SA	RMS-SA	Refrigerant Monitoring System (SemiAnn	RMS-SA - Refrigerant Monitoring System (SemiAnnual)
ROD01SA	RO01SA	ROOF, DRAIN	ROD01SA - ROOF, DRAIN
ROOF-AN	ROOF-AN	Roof (Annual)	ROOF-AN - Roof (Annual)
ROOF-SA	ROOF-SA	Roof (SemiAnnual)	ROOF-SA - Roof (SemiAnnual)
SB013Y	ES093Y	SWITCHBOARD	SB013Y - SWITCHBOARD
SCAF01AN	W-05	SCAFFLDING	SCAF01AN - SCAFFLDING
SCISO01AN	E-36	SWITCH, ISOLATION	SCISO01AN - SWITCH, ISOLATION
SD01QU	AL17QU	SM DETECT & ALARM	SD01QU - SM DETECT & ALARM
SLIFT-AN	SLIFT-AN	Sewage Lift Station (Annual)	SLIFT-AN - Sewage Lift Station (Annual)
SMELT01AN	S-22	SNOW METING SYSTEM	SMELT01AN - SNOW METING SYSTEM
SP01AN	S-07	PUMP, SUMP	SP01AN - PUMP, SUMP
SS-ACU-SA	SS-ACU-SA	Split System: Air Conditioner Units (Semi	SS-ACU-SA - Split System: Air Conditioner Units (SemiAnnual)
SS-HPU-QU	SS-HPU-QU	Split System: Heat Pump Units (Quarterl	SS-HPU-QU - Split System: Heat Pump Units (Quarterly)
SS-HPU-SA	SS-HPU-SA	Split System: Heat Pump Units (SemiAnr	SS-HPU-SA - Split System: Heat Pump Units (SemiAnnual)
SSLS-AN	SSLS-AN	Sanitary Sewer Lift Station (Annual)	SSLS-AN - Sanitary Sewer Lift Station (Annual)
SSLS-SA	SSLS-SA	Sanitary Sewer Lift Station (SemiAnnual)	SSLS-SA - Sanitary Sewer Lift Station (SemiAnnual)
STRAIN-AN	STRAIN-AN	Strainers (Annual)	STRAIN-AN - Strainers (Annual)
STRAIN-SA	STRAIN-SA	Strainers (SemiAnnual)	STRAIN-SA - Strainers (SemiAnnual)
SURGE01AN	E-31	SURGE PROTECTION	SURGE01AN - SURGE PROTECTION
SWEEP01AN	S-05	SWEEP, SUMP PUMP	SWEEP01AN - SWEEP, SUMP PUMP
SWGR-AN	SWGR-AN	Switchgear (Annual)	SWGR-AN - Switchgear (Annual)
SWGR-MO	SWGR-MO	Switchgear (Monthly)	SWGR-MO - Switchgear (Monthly)
T07-2Y	T07-2Y	TANK, FUEL STORAGE (WITH CONTR	T07-2Y - TANK, FUEL STORAGE (WITH CONTROLS)
T07-AN	T07-AN	TANK, FUEL STORAGE (WITH CONTR	T07-AN - TANK, FUEL STORAGE (WITH CONTROLS)
T07-MO	T07-MO	TANK, FUEL STORAGE (WITH CONTR	T07-MO - TANK, FUEL STORAGE (WITH CONTROLS)
T08-3Y	T08-3Y	TANK, WATER WITH CONTROLS	T08-3Y - TANK, WATER WITH CONTROLS
T08-AN	T08-AN	TANK, WATER WITH CONTROLS	T08-AN - TANK, WATER WITH CONTROLS
T09-AN	T09-AN	TANK, EXPANSION OR AIR SEPARAT	T09-AN - TANK, EXPANSION OR AIR SEPARATOR
T10-2Y	T10-2Y	TANK, DIESEL DAY (WITH CONTROLS	T10-2Y - TANK, DIESEL DAY (WITH CONTROLS)
T10-AN	T10-AN	TANK, DIESEL DAY (WITH CONTROLS	T10-AN - TANK, DIESEL DAY (WITH CONTROLS)
TANKD-AN	TANKD-AN	Tank,Day (Annual)	TANKD-AN - Tank,Day (Annual)
TANKD-MO	TANKD-MO	Tank,Day (Monthly)	TANKD-MO - Tank,Day (Monthly)
TANKD-QU	TANKD-QU	Tank,Day (Quarterly)	TANKD-QU - Tank,Day (Quarterly)
TANKD-SA	TANKD-SA	Tank,Day (SemiAnnual)	TANKD-SA - Tank,Day (SemiAnnual)
TANKW-AN	TANKW-AN	Tank , Water Storage (Annual)	TANKW-AN - Tank , Water Storage (Annual)
TANKW-SA	TANKW-SA	Tank , Water Storage (SemiAnnual)	TANKW-SA - Tank , Water Storage (SemiAnnual)
TD01AN	E-34	TRANSFORMER, DRY	TD01AN - TRANSFORMER, DRY
TD01QU	E-35	TRANSFORMER, DRY	TD01QU - TRANSFORMER, DRY
TF015Y	TF015Y	TANK, FUEL	TF015Y - TANK, FUEL
TF035Y	TF035Y	TANK, FUEL	TF035Y - TANK, FUEL
TF03AN	TF03AN	TANK, FUEL	TF03AN - TANK, FUEL
TK01AN	TK01AN	TANK, SEPTIC	TK01AN - TANK, SEPTIC
TL01MO	TL01MO	GREASE TRAP	TL01MO - GREASE TRAP
TO01AN	E-32	TRANSFORMER, OIL	TO01AN - TRANSFORMER, OIL
TRAP015Y	T-09	TRAP, SOLID	TRAP015Y - TRAP, SOLID
TRAP01AN	T-08	TRAP, SOLID	TRAP01AN - TRAP, SOLID
TRBN01AN	T-10	TURBINE	TRBN01AN - TURBINE
TS01AN	TS01AN	TRANSFER SWITCH, AUTO	TS01AN - TRANSFER SWITCH, AUTO
TS01MO	TS01MO	TRANSFER SWITCH, AUTO	TS01MO - TRANSFER SWITCH, AUTO
TS-AN	TS-AN	Transfer Switch (Annual)	TS-AN - Transfer Switch (Annual)
TS-SA	TS-SA	Transfer Switch (SemiAnnual)	TS-SA - Transfer Switch (SemiAnnual)
TS-WK	TS-WK	Transfer Switch (Weekly)	TS-WK - Transfer Switch (Weekly)
UH-E-AN	UH-E-AN	Unit Heater, Electric (Annual)	UH-E-AN - Unit Heater, Electric (Annual)
UH-G-AN	UH-G-AN	Unit Heater, Gas (Annual)	UH-G-AN - Unit Heater, Gas (Annual)
UH-WH-AN	UH-WH-AN	Cabinet Unit Heater, WH (Annual)	UH-WH-AN - Cabinet Unit Heater, WH (Annual)
UN01AN	U-01	UNIT HEATER	UN01AN - UNIT HEATER
UN02AN	U-02	UNIT HEATER	UN02AN - UNIT HEATER
UP01AN	UP01AN	UNINTERRUPTIBLE POWER SYSTEM	UP01AN - UNINTERRUPTIBLE POWER SYSTEM
UP01DA	UP01DA	UNINTERRUPTIBLE POWER SYSTEM	UP01DA - UNINTERRUPTIBLE POWER SYSTEM
UP01MO	UP01MO	UNINTERRUPTIBLE POWER SYSTEM	UP01MO - UNINTERRUPTIBLE POWER SYSTEM
UP01SA	UP01SA	UNINTERRUPTIBLE POWER SYSTEM	UP01SA - UNINTERRUPTIBLE POWER SYSTEM

RSU	ROOM SERVICE UNIT
RTU	ROOF TOP UNIT
RV	VENT, RELIEF
SA	SAUNA
SB	SWITCHBOARD
SC	SWITCH
SCAF	SCAFFLDING
SCBP	SWITCH, BYPASS
SCDIFF	SWITCH, DIFFERENTIAL PRESSURE
SCFD	SWITCH, FUSED DISCONNECT
SCFI	SWITCH, FILTER DIF PRESSURE
SCFS	SWITCH, FUSED SAFETY
SCISO	SWITCH, ISOLATION
SCOIL	COIL, SOLENOID
SD	SM DETECT & ALARM
SE	SEPARATOR
SE-OIL	SEPARATOR, Oil and GAS
SEWAGE	SEWAGE TREATMENT PLANT
SG	SWITCHGEAR
SH	SHREDDER
SHELV	SHELVING UNIT
SHUT	SHUTTER
SIGN	SIGNAL
SINK	SINK
SINK	SINK, PREPARATION
SITE	SITE
SMELT	SNOW METING SYSTEM
SN	SENSOR
SNDH	SENSOR, DUCT HUMITY
SNDIFF	SENSOR, DIFFERENTIAL PRESSURE
SNDIFF	SENSOR, DIFFERENTIAL PRESSURE
SNDT	SENSOR, DUCT TEMPERATURE
SNF	SENSOR, FLOW
SNRT	SENSOR, ROOM TEMP
SO	HEATER, SOLAR WATER
SORT	SORTING SELF
SOUND	SOUND ATTENUATOR
SP	PUMP, SUMP
SQ	EQUIPMENT, SHOP
ST	STARTER
STACK	STACKS, AIR
STORA	STORAGE, LOCKERS & MISC
STOVE	STOVE
STP	STP SYSTEMS (Fuel & Oil Additives)
STRUCT	STAND-ALONE STRUCTURE (Non-Building)
SUBS	SUBSTAION
SUMPT	SUMP, TRANSITION
SUPPLY	SUPPLY SYSTEM
SURGE	SURGE PROTECTION
SW	SWIM POOL & EQUIP
SWEEP	SWEEP, SUMP PUMP
SWGATE	GATE, POOL
SWNFS	SWITCH, NON-FUSED SAFETY
SYHCL	SYSTEM, HYPOCHLORITE GEN
SYSTEM	SYSTEM
TANK	TANK, OTHER
TBL	TANK, BLOWER
TBOX	TERMINAL BOXES
TBUFF	TANK, BUFFER
TCHEM	TANK, CHEMICAL
TCN	TANK, CONDENSATION
TD	TRANSFORMER, DRY
TELEV	TELEVATOR
TF	TANK, FUEL
TFU	TANK, FUEL (UNDERGROUND)
TGN	TANK, GENERATOR
TGRAV	INTANK, GRAVITY
TH	TANK, HYDRAULIC
THEXP	THERMAL EXPANSION

UP01WK	UP01WK	UNINTERRUPTIBLE POWER SYSTEM	UP01WK - UNINTERRUPTIBLE POWER SYSTEM
UP03MO	UP03MO	UNINTERRUPTIBLE POWER SYSTEM	UP03MO - UNINTERRUPTIBLE POWER SYSTEM
UP03SA	UP03SA	UNINTERRUPTIBLE POWER SYSTEM	UP03SA - UNINTERRUPTIBLE POWER SYSTEM
UPS-AN	UPS-AN	Uninterruptible Power System (Annual)	UPS-AN - Uninterruptible Power System (Annual)
UPS-SA	UPS-SA	Uninterruptible Power System (SemiAnn	UPS-SA - Uninterruptible Power System (SemiAnnual)
UST-AN	UST-AN	Tank, Fuel UST (Annual)	UST-AN - Tank, Fuel UST (Annual)
V01-SA	V01-SA	PLUMBING FIXTURE GROUP (LARGE	V01-SA - PLUMBING FIXTURE GROUP (LARGE)
V02-AN	V02-AN	PLUMBING FIXTURE GROUP (SMALL)	V02-AN - PLUMBING FIXTURE GROUP (SMALL)
V04-5Y	V04-5Y	VALVE GROUP, SMALL (MANUALLY C	V04-5Y - VALVE GROUP, SMALL (MANUALLY OPERATED)
V04-AN	V04-AN	VALVE GROUP, SMALL (MANUALLY C	V04-AN - VALVE GROUP, SMALL (MANUALLY OPERATED)
V05-5Y	V05-5Y	VALVE, GROUP, LARGE, MANUALLY (	V05-5Y - VALVE, GROUP, LARGE, MANUALLY OPERATED
V05-AN	V05-AN	VALVE, GROUP, LARGE, MANUALLY (	V05-AN - VALVE, GROUP, LARGE, MANUALLY OPERATED
V09-AN	V09-AN	BACKFLOW PREVENTOR	V09-AN - BACKFLOW PREVENTOR
V12-QU	V12-QU	FILTER, HYDRONIC BYPASS	V12-QU - FILTER, HYDRONIC BYPASS
V15-AN	V15-AN	TRAP PRIMER VALVE (ELECTRIC)	V15-AN - TRAP PRIMER VALVE (ELECTRIC)
VA01AN	F-02	VALVE	VA01AN - VALVE
VA02AN	V-03	VALVE	VA02AN - VALVE
VAMO015Y	V-06	VALVES, MANUALLY OPERATED	VAMO015Y - VALVES, MANUALLY OPERATED
VAMO01AN	V-05	VALVES, MANUALLY OPERATED	VAMO01AN - VALVES, MANUALLY OPERATED
VATEMP01AN	CV13AN	VALVE, TEMPERATURE CONTROL	VATEMP01AN - VALVE, TEMPERATURE CONTROL
VAV-AN	VAV-AN	Variable Air Volume Box (Annual)	VAV-AN - Variable Air Volume Box (Annual)
VB01AN	GT03AN	BARRIER, VEHICLE	VB01AN - BARRIER, VEHICLE
VES-QU	VES-QU	Vehicle Exhaust System (Quarterly)	VES-QU - Vehicle Exhaust System (Quarterly)
VES-WK	VES-WK	Vehicle Exhaust System (Weekly)	VES-WK - Vehicle Exhaust System (Weekly)
VFD-AN	VFD-AN	Variable Frequency Drive (Annual)	VFD-AN - Variable Frequency Drive (Annual)
VFD-MO	VFD-MO	Variable Frequency Drive (Monthly)	VFD-MO - Variable Frequency Drive (Monthly)
VFD-QU	VFD-QU	Variable Frequency Drive (Quarterly)	VFD-QU - Variable Frequency Drive (Quarterly)
VFD-SA	VFD-SA	Variable Frequency Drive (SemiAnnual)	VFD-SA - Variable Frequency Drive (SemiAnnual)
VLS-MO	VLS-MO	Vehicle Lift Station (Monthly)	VLS-MO - Vehicle Lift Station (Monthly)
VLS-QU	VLS-QU	Vehicle Lift Station (Quarterly)	VLS-QU - Vehicle Lift Station (Quarterly)
VLS-SA	VLS-SA	Vehicle Lift Station (SemiAnnual)	VLS-SA - Vehicle Lift Station (SemiAnnual)
VLS-WK	VLS-WK	Vehicle Lift Station (Weekly)	VLS-WK - Vehicle Lift Station (Weekly)
VR01AN	VR01AN	VOLTAGE REGULATOR	VR01AN - VOLTAGE REGULATOR
W02-AN	W02-AN	WATER TREATMENT SYS (CHLORINA	W02-AN - WATER TREATMENT SYS (CHLORINATION SKID)
W02-MO	W02-MO	WATER TREATMENT SYS (CHLORINA	W02-MO - WATER TREATMENT SYS (CHLORINATION SKID)
W02-WK	W02-WK	WATER TREATMENT SYS (CHLORINA	W02-WK - WATER TREATMENT SYS (CHLORINATION SKID)
W03-AN	W03-AN	WATER TREATMENT SYSTEM (SOFTI	W03-AN - WATER TREATMENT SYSTEM (SOFTENER SKID)
W03-SA	W03-SA	WATER TREATMENT SYSTEM (SOFTI	W03-SA - WATER TREATMENT SYSTEM (SOFTENER SKID)
W03-WK	W03-WK	WATER TREATMENT SYSTEM (SOFTI	W03-WK - WATER TREATMENT SYSTEM (SOFTENER SKID)
W04-AN	W04-AN	METER, WATER (BADGERMETER TUI	W04-AN - METER, WATER (BADGERMETER TURBO SERIES)
W04-TH	W04-TH	METER, WATER (BADGERMETER TUI	W04-TH - METER, WATER (BADGERMETER TURBO SERIES)
W08-MO	W08-MO	WATER TREATMENT, HVAC HYDRON	W08-MO - WATER TREATMENT, HVAC HYDRONIC WATER
W14-MO	W14-MO	IRRIGATION SYSTEM	W14-MO - IRRIGATION SYSTEM
W14-SA	W14-SA	IRRIGATION SYSTEM	W14-SA - IRRIGATION SYSTEM
WB-AN	WB-AN	Wedge Barrier (Annual)	WB-AN - Wedge Barrier (Annual)
WB-MO	WB-MO	Wedge Barrier (Monthly)	WB-MO - Wedge Barrier (Monthly)
WB-SA	WB-SA	Wedge Barrier (SemiAnnual)	WB-SA - Wedge Barrier (SemiAnnual)
WB-WK	WB-WK	Wedge Barrier (Weekly)	WB-WK - Wedge Barrier (Weekly)
WD&TS-AN	WD&TS-AN	Water Distribution and Treatment Systen	WD&TS-AN - Water Distribution and Treatment System (Annual)
WD&TS-MO	WD&TS-MO	Water Distribution and Treatment Systen	WD&TS-MO - Water Distribution and Treatment System (Monthly)
WD&TS-QU	WD&TS-QU	Water Distribution and Treatment Systen	WD&TS-QU - Water Distribution and Treatment System (Quarterly)
WD&TS-WK	WD&TS-WK	Water Distribution and Treatment Systen	WD&TS-WK - Water Distribution and Treatment System (Weekly)
WH-E-AN	WH-E-AN	Water Heater, Electric (Annual)	WH-E-AN - Water Heater, Electric (Annual)
WH-G-AN	WH-G-AN	Water Heater, Gas (Annual)	WH-G-AN - Water Heater, Gas (Annual)
WP-AN	WP-AN	Chilled/Hot Water Pumps (Annual)	WP-AN - Chilled/Hot Water Pumps (Annual)
WP-QU	WP-QU	Chilled/Hot Water Pumps (Quarterly)	WP-QU - Chilled/Hot Water Pumps (Quarterly)
WP-SA	WP-SA	Chilled/Hot Water Pumps (SemiAnnual)	WP-SA - Chilled/Hot Water Pumps (SemiAnnual)
WS01QU	W-03	WATER SOFTENER	WS01QU - WATER SOFTENER
WSTC-AN	WSTC-AN	Water Storage Tank Controls (Annual)	WSTC-AN - Water Storage Tank Controls (Annual)
WT033Y	TW033Y	TANK, WATER STORAGE	WT033Y - TANK, WATER STORAGE
WT03AN	TW03AN	TANK, WATER STORAGE	WT03AN - TANK, WATER STORAGE
WT053Y	TW053Y	TANK, WATER STORAGE	WT053Y - TANK, WATER STORAGE
X01-AN	X01-AN	LOAD BANK	X01-AN - LOAD BANK
X50-QU	X50-QU	PAPER SHREDDER	X50-QU - PAPER SHREDDER
XFMR-AN	XFMR-AN	Transformer, Oil Filled (Annual)	XFMR-AN - Transformer, Oil Filled (Annual)
XFMR-MO	XFMR-MO	Transformer, Oil Filled (Monthly)	XFMR-MO - Transformer, Oil Filled (Monthly)
XFMR-QU	XFMR-QU	Transformer, Oil Filled (Quarterly)	XFMR-QU - Transformer, Oil Filled (Quarterly)
XFMR-SA	XFMR-SA	Transformer, Oil Filled (SemiAnnual)	XFMR-SA - Transformer, Oil Filled (SemiAnnual)
	C-01	<missing>	C-01 - <missing>

THN	HYDROPNEUMATIC TANK
TICE	TANK, ICE STORAGE
TIMER	Electronic Time Control
TK	TANK, SEPTIC
TL	TRAP, GREASE
TM	TRAP, HAZARDOUS MATL
TO	TRANSFORMER, OIL
TOIL	TOILET
TOILEX	TOILET, EXHAUST
TOLTC	TRANSFORMER, ON LOAD TAP CHANGER
TPAD	TRANSFORMER, PAD MOUNTED
TPIT	TELEPHONE PIT
TPRESS	TANK, PRESSURIZER
TR	TRANSFORMER
TRACT	TRACTOR
TRAP	TRAP, SOLID
TRAY	DISPENSER, DROP-IN TRAY
TRHT	TRANSFORMER, H.T. (HIGH TENSION)
TRHU	TRANSFORMER, HUMIDITY
TRI	TRANSFORMER, INST
TRM	TRANSFORMER, MEDIUM VOLTAGE
TRP	TRANSFORMER, PRESSURIZE
TRSD	TRANSFORMER, STEP-DOWN
TS	TRANSFER SWITCH, AUTO
TSALT	TANK, SALT
TSM	TRANSFER SWITCH, MANUAL
TSOL	TANK, SOLAR WATER
TSTAT	TANK, STATIONARY
UC	UNIT CONDITIONING
UN	UNIT HEATER
UP	UNINTERRUPTIBLE POWER SYSTEM
UP	UNINTERRUPTIBLE POWER SYSTEM
UR	TOILET, URINAL
UV	ULTRA VIOLET (UV)
UVCL	CLARIFIER, UV
UVMS	MONITORING SYSTEM, UV
UVSN	SENSOR, UV
VA	VALVE
VA2W	VALVE, 2WAY CONTROL
VAAC	VALVE, ACTUATOR
VAAF	VALVE, AUTOMAT FLOW
VABFL	VALVE, BUTTERFLY
VABP	VALVE, BACKFLOW PREVE
VACK	VALVE, CHECK
VADI	VALVE, DIVERTING
VADR	VALVE, DRAIN
VAHT	VALVE, HEATING
VAIR	VALVE, AIR
VAISO	VALVE, ISOLATION GATE
VAMO	VALVES, MANUALLY OPERATED
VAPR	VALVE, PRESSURE RELIE
VART	VALVE, RETURN
VASHUT	VALVE, SHUT-OFF
VASW	VALVE, POOL
VATEMP	VALVE, TEMPERATURE CONTROL
VATM	VALVE, THERMO MIX
VB	BARRIER, VEHICLE
VC	VEHICLE CONTROL
VCF	VENT, CENTRIFUGAL
VD	VARIABLE SPEED DRIVE
VE	VENTILATION
VEHCL	FORLIFT, TRUCKS, VEHICLES
Venter	VENTILATOR, ROOF
VENTI	VENTILATOR
VF	VARIABLE FREQUENCY
VH	HOOD, VENTILATION
VL	VEHICLE LIFT
VR	VOLTAGE REGULATOR
VRM	VOLTAGE REGULATOR (MEDIUM VOLTAGE)

	E-24	**<missing>**	E-24 - <missing>
	E-25	**<missing>**	E-25 - <missing>
	E-37	**<missing>**	E-37 - <missing>
	F-39	**<missing>**	F-39 - <missing>
	H-02	**<missing>**	H-02 - <missing>
	C-05	**<Not Sure>**	C-05 - <Not Sure>
	E-17	**<Not Sure>**	E-17 - <Not Sure>
	E-41	**<Not Sure>**	E-41 - <Not Sure>
	I-03	**<Not Sure>**	I-03 - <Not Sure>
	GT01		GT01 -
	FL01		FL01 -
	WS01		WS01 -

VSURG	TRANS VOLTAGE SUPPRE
VV	VAV TERMINAL
WA	WATER COOLER
WAE	TANK, AIE EXPANSION
WALL	WALL
WALLE	WALL, EXTERIOR
WALLI	WALL, INTERIOR
WASTE	WASTE RECEPTABLE
WC	WATER CONDITIONER
WCI	WATER CIRCUIT
WD	WATER DISTILLER
WDISP	WATER DISPOSER
WE	TANK, EXPANSION
WELL	SITE WELL
WF	WATER FILTER
WFLUSH	WALL FLUSHING
WFZ	FREEZER
WFZ	FREEZER, WALK-IN
WH	WATER HEATER
WH	WATER HEATER
WHB	WATER HEATER, BOOSTER
WHGEN	TRANSFORMER, IGNITION
WM	WASHING MACHINE
WP	PUMP, WATER
WPURE	WATER PURIFIER
WRE	REFRIGERATOR, WALK-IN
WS	WATER SOFTENER
WSF	FILTER, WATER-SAND
WT	TANK, WATER STORAGE
WTH	TANK, HOT WATER
WTH	TANK, HOT WATER
WW	WATER WELL
WWST	WATER, WASTER
WY	WATER TREATMENT SYS
WYSK	WATER TREATMENT SKID
XR	X-RAY UNIT

Component Codes

CTT Code	Description	CTT LookUp
0	Other	0 - Other
AB	ABSOLUTE FILTERS	AB - ABSOLUTE FILTERS
AC	ACTIVATED CARBON	AC - ACTIVATED CARBON
AF	AIR FILTER	AF - AIR FILTER
AV	AIR RELIF VALVE	AV - AIR RELIF VALVE
AL	ALTERNATOR	AL - ALTERNATOR
AN	ANALOG METER DISI	AN - ANALOG METER DISPLAY
AM	ANALOG METER PAN	AM - ANALOG METER PANEL
AO	ANALOG OUTPUTS	AO - ANALOG OUTPUTS
AP	ANNUNCIATOR PANI	AP - ANNUNCIATOR PANEL
AU	AUTOMATIC CONTRI	AU - AUTOMATIC CONTROL
AT	AUTOMATIC FILTER	AT - AUTOMATIC FILTER
AS	AUXILIARY SWITCHE	AS - AUXILIARY SWITCHES
BV	BALL VALVES	BV - BALL VALVES
B	BATTERY	B - BATTERY
BC	BATTERY CHARGER	BC - BATTERY CHARGER
BE	BELT	BE - BELT
BR	BRONZE CHECK VAL	BR - BRONZE CHECK VALVE
BG	BRONZE GATE VALVI	BG - BRONZE GATE VALVE
BI	BRONZE IMPELLER	BI - BRONZE IMPELLER
BU	BUTTERFLY VALVE	BU - BUTTERFLY VALVE
CC	CAB CONTROLLER	CC - CAB CONTROLLER
CF	CARBON FILTER	CF - CARBON FILTER
RC	CASING RELIEF VALV	RC - CASING RELIEF VALVE
CP	CENTRIFUGAL PUMP	CP - CENTRIFUGAL PUMP
CA	CHLORINE ANALYZEF	CA - CHLORINE ANALYZER
CB	CIRCUIT BREAKER	CB - CIRCUIT BREAKER
C	CLOSER	C - CLOSER
CO	COIL	CO - COIL
CV	COMBINATION VALV	CV - COMBINATION VALVE
PU	COMMON PURGE VA	PU - COMMON PURGE VALVE
CU	CONDENSING UNIT	CU - CONDENSING UNIT
BX	CONTROL BOX	BX - CONTROL BOX
CD	CONTROL DAMPER	CD - CONTROL DAMPER
PN	CONTROL PANEL	PN - CONTROL PANEL
C1	CONTROLLER	C1 - CONTROLLER
TW	CONTROLLER TWIDC	TW - CONTROLLER TWIDO
CL	COOLANT HEATER	CL - COOLANT HEATER
CY	CYLINDRICAL LEVERS	CY - CYLINDRICAL LEVERSET
DY	DAYTANK CONTROLI	DY - DAYTANK CONTROLLER
DS	DEADMAN SWITCH	DS - DEADMAN SWITCH
DD	DIGITAL DISPLAY	DD - DIGITAL DISPLAY
DG	DIRECT GAUGE	DG - DIRECT GAUGE
DP	DISPLAY PANEL	DP - DISPLAY PANEL
DC	DRY CONTACTS	DC - DRY CONTACTS
EA	ELECTRIC ACTUATOR	EA - ELECTRIC ACTUATOR
EN	ENGINE	EN - ENGINE
EF	ESS FLOW SWITCH	EF - ESS FLOW SWITCH
EI	ESS ISOLATION VALV	EI - ESS ISOLATION VALVE
ES	ESS TANK	ES - ESS TANK
FI	FILTER	FI - FILTER
FC	FILTER CARTRIDGES	FC - FILTER CARTRIDGES
FH	FILTER HOUSINGS	FH - FILTER HOUSINGS
FD	FIRE PUMP DRIVER	FD - FIRE PUMP DRIVER
FL	FLOW CONTROL	FL - FLOW CONTROL
FM	FLOW METER	FM - FLOW METER
FS	FLOW SWITCH	FS - FLOW SWITCH
FF	FUEL FILTER	FF - FUEL FILTER
FU	FUEL PUMP	FU - FUEL PUMP
FW	FUEL/WATER SEPER/	FW - FUEL/WATER SEPERATOR
6	FULL CIRCLE BUBBLE	6 - FULL CIRCLE BUBBLERS
FP	FULL PORT VALVE	FP - FULL PORT VALVE
GA	GAUGE ASSEMBLY	GA - GAUGE ASSEMBLY
GL	GLOBE VALVE	GL - GLOBE VALVE

Safety Regulations
ASME A17.1
AS–AS1735
CAN/CSA B44
EN 81-1
EN 81-2
JIS
Mercursor
PUBEL
Singapore
GB-5030
Other

EL Duty
FREIGHT
SERVICE
DUMBWAITER
PASSENGER

Capacity Metric
N/A
lbs
Kg

Speed Metric
N/A
fpm
m/s

Travel Metric
N/A
Ft
mm

EL Traction Type	EL Traction Desc	EL Traction
HYDRAULIC	INDIRECT	HYDRAULIC - INDIRECT
TRACTION	DRUM	TRACTION - DRUM
TRACTION	GEARLESS	TRACTION - GEARLESS
TRACTION	GEARED	TRACTION - GEARED
HYDRAULIC	DIRECT	HYDRAULIC - DIRECT

EL_Operation
Duplex
Goup
Simplex

HG	HEGA FILTER	HG - HEGA FILTER
HP	HEPA FILTER	HP - HEPA FILTER
HU	HYDRAULIC POWER	HU - HYDRAULIC POWER UNIT
CR	INTERFACE CARD	CR - INTERFACE CARD
IP	INTERFACE PANEL	IP - INTERFACE PANEL
IC	IRON CHECK VALVE	IC - IRON CHECK VALVE
IB	ISOLATED BUS	IB - ISOLATED BUS
IV	ISOLATION VALVE	IV - ISOLATION VALVE
JC	JOCKEY CONTROLLEI	JC - JOCKEY CONTROLLER
LS	LEAK SENSOR	LS - LEAK SENSOR
LP	LEVEL GAUGING PRC	LP - LEVEL GAUGING PROBE
LT	LEVEL TRANSMITTER	LT - LEVEL TRANSMITTERS
GH	LIFTMASTER GH MO	GH - LIFTMASTER GH MOTOR
LI	LINE STRAINERS	LI - LINE STRAINERS
LG	LIQUID GAUGES	LG - LIQUID GAUGES
LB	LOAD BANK	LB - LOAD BANK
LD	LOADSHED	LD - LOADSHED
LF	LOW FLOW VALVE	LF - LOW FLOW VALVE
MC	MAIN CONTROLLER	MC - MAIN CONTROLLER
MP	METERING PUMPS	MP - METERING PUMPS
MO	MOTOR	MO - MOTOR
MS	MOTOR STARTER BA	MS - MOTOR STARTER BASE
NA	NETWORK ANNUNCI	NA - NETWORK ANNUNCIATOR
OI	OIL FILTER	OI - OIL FILTER
IN	OPERATOR INTERFA	IN - OPERATOR INTERFACE
OP	OPERATOR PANEL	OP - OPERATOR PANEL
OT	OTHER - Specify	OT - OTHER - Specify
SY	Outside Stem and Yo	SY - Outside Stem and Yoke, Resilient Wedge, Flanged Gate Valves
PE	PESB VALVE	PE - PESB VALVE
PL	PLC CONTROLLER	PL - PLC CONTROLLER
PO	POOL COVER	PO - POOL COVER
FX	POOL LIGHT FIXTURE	FX - POOL LIGHT FIXTURE
HD	POP UP SPRAY HEAD	HD - POP UP SPRAY HEADS
CM	POWER COMMAND	CM - POWER COMMAND
PI	POWER INTERFACE	PI - POWER INTERFACE
FR	PRE-FILTER	FR - PRE-FILTER
PG	PRESSURE GAUGES	PG - PRESSURE GAUGES
PD	PRS DIAL	PD - PRS DIAL
PC	PUMP CONTROL	PC - PUMP CONTROL
PF	PUMP FLOW SWITCH	PF - PUMP FLOW SWITCHES
QC	QUICK COUPLING VA	QC - QUICK COUPLING VALVE
RA	RADIATOR	RA - RADIATOR
SN	RAIN SENSOR	SN - RAIN SENSOR
CI	RECIRCULATION PUN	CI - RECIRCULATION PUMP
RV	REDUCING VALVE	RV - REDUCING VALVE
RM	REMOTE ANNUNCIA	RM - REMOTE ANNUNCIATOR
RP	REMOTE PANEL	RP - REMOTE PANEL
RT	REMOTE TANK CONT	RT - REMOTE TANK CONTROL
RE	RESERVOIR SENSOR	RE - RESERVOIR SENSOR
RS	ROOM SENSOR	RS - ROOM SENSOR
RN	ROTARY NOZZLES	RN - ROTARY NOZZLES
SL	SEALS	SL - SEALS
SE	SEEWATER SWITCH	SE - SEEWATER SWITCH
OF	SHUT OFF VALVES	OF - SHUT OFF VALVES
SS	SIMPLEX STRAINER	SS - SIMPLEX STRAINER
30	SLIDE DRIVE 30F	30 - SLIDE DRIVE 30F
SO	SOFTENER	SO - SOFTENER
SC	SOLAR COLLECTOR	SC - SOLAR COLLECTOR
SV	SOLENOID VALVE	SV - SOLENOID VALVE
ST	STARTER	ST - STARTER
CN	STARTER CONTROLLI	CN - STARTER CONTROLLER
SD	SUCTION DIFFUSER	SD - SUCTION DIFFUSER
SA	SWING ASSEMBLY	SA - SWING ASSEMBLY
SI	SWING CHECK VALVI	SI - SWING CHECK VALVE
PR	TANK LEVEL PROBES	PR - TANK LEVEL PROBES
TN	TANK SUMP	TN - TANK SUMP
TS	THERMAL SWITCH	TS - THERMAL SWITCH
TH	THERMOSTAT	TH - THERMOSTAT
SW	TRANSFER SWITCH	SW - TRANSFER SWITCH

SP	TRANSITION SUMP	SP - TRANSITION SUMP
VA	VALVE ACTUATORS	VA - VALVE ACTUATORS
VB	VALVE BOXES	VB - VALVE BOXES
VD	VARIABLE DRIVE	VD - VARIABLE DRIVE
VT	VERTICAL TURBINE	VT - VERTICAL TURBINE
VI	VIPER AIR MOVER	VI - VIPER AIR MOVER
WF	WATER FILTER	WF - WATER FILTER
WS	WATER, SUMP	WS - WATER, SUMP

SECTION 017905
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. The purpose of this section is to specify demonstration and training for Government operation and maintenance (O&M) of building systems and equipment, including warranty orientation.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

1.03 SUBMITTALS

A. The Contractor shall submit, in accordance with Section 013305, *Construction Submittals*, the following:

1. Training Plan: Two (2) hard copies and one CD-ROM version shall be submitted one-hundred-eighty (180) calendar days prior to Substantial Completion and approved before field training occurs.
2. Training Records: The Contractor shall submit with the request for inspection for Substantial Completion.
3. Training and Demonstration Videos shall be turned over to the Project Director/COR after the completion of all Training sessions and prior to Substantial Completion.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TRAINING PLAN

A. The Contractor shall prepare a training plan for the operation and maintenance of building systems and equipment installed in the completed facilities and for the use of the computerized maintenance plan. The Contractor shall complete and submit Training Agendas in accordance with the OBO Generic Commissioning Plan, Appendix 1 Form F OPERATIONS AND MAINTENANCE TRAINING AGENDA for each training activity associated with equipment and systems. Equipment and systems are listed in the table in Specification Section 019115.

B. The Contractor shall provide training for hardware and major components as specified in the Contract Technical Specifications.

C. The prepared plan shall be applicable to Government O&M personnel and include at a minimum:

1. Detailed training objectives, lesson plans, hands-on equipment practical exercises, and written exam for each training session held.
2. Requirements for the completion of classroom and hands-on training prior to Substantial Completion.
3. Detail of craft type and number of trainees, level and rigor of training required, topics to be covered, duration of each subject training component, and methods that shall be used in executing the training (classroom, hands-on, video-media, computerized tutorials, etc.).
4. Testing requirements for independent validation of training program objectives. Testing requirements shall include written quizzes, examinations, and performance testing.
5. Training Topics:
   a. Operation and maintenance of installed building systems, subsystems, and equipment, to include Government-furnished.
   b. Monitoring and testing procedures, including operation and maintenance of monitoring and testing equipment.
   c. Verification and documentation of performance.
   d. Maintenance instructions and demonstrations relevant to the continued maintenance of the entire facility including equipment, devices, surfaces, finishes, fixtures, and similar elements.

3.02 OPERATION AND MAINTENANCE TRAINING

A. The Contractor shall provide, in accordance with a Government-accepted Training Plan, training for Government O&M personnel, support staff security system personnel, and others as designated by Project Director/COR.

B. Integration and scheduling of training sessions are of the utmost importance. The Contractor shall coordinate the availability of Government O&M personnel and facilities support staff, then plan and schedule O&M training sessions to maximize attendance. This may require an innovative scheduling of training such as more than one session in a given systems area or other similar solutions.

C. Training shall be conducted in a classroom setting at the Project Site with appropriate schematics, handouts, visual and audio training aids, and hands-on application.

D. Training sessions shall be planned and scheduled such that, to the maximum extent practicable, attendees shall acquire Site-specific knowledge of the facilities, equipment, and systems through classroom training just prior to participating in the Contractor's and vendor's hands-on demonstrations as described herein.

E. Training sessions shall be conducted in both English and the host national language as applicable to Government O&M personnel.

F. Each classroom training and field demonstration session shall be videotaped for future review by participants.

G. The Contractor shall use Government-provided Furniture Product Care Data in demonstration and training activities.

H. The Contractor shall utilize instructors who are thoroughly trained and experienced in operation and maintenance of facilities systems, equipment, and testing apparatus. The Contractor shall ensure the following:

1. Appropriate fabrication and installation subcontractors provide training on Project facility components and building systems.
2. Equipment vendors provide classroom and hands-on training on the specifics of each major equipment item, including modes and ranges of operation, philosophy and approaches to Reliability Centered Maintenance, and troubleshooting and repair tips, tricks, traps, and techniques.
3. Building automation system and fire alarm vendors provide classroom and hands-on training per their Specification sections.
4. Elevator systems training includes operations and maintenance of safety systems, interfacing with standby power, annunciation systems, digital control systems, UPS backup of digital control systems, etc.

I. Training Records:

1. The Contractor shall document each training session, its duration, the subjects covered, and the printed name and signature of each attendee.
2. The Contractor shall include training critique forms.
3. These documents shall become part of the final Project Record Documents set, as described in Section 017705, *Closeout Procedures*.

3.03 DEMONSTRATION OF FACILITIES

A. The Contractor shall provide demonstration of functional facilities to the Government O&M personnel, facilities support and management personnel, and others as designated by Project Director/COR.

B. The Contractor shall demonstrate all manual and automatic operational procedures and maintenance requirements for each installed building system and sub-system prior to commissioning.

C. As applicable, the Contractor shall review final record information provided to the Government on the following topics: operating procedures, maintenance, cleaning, spare parts, extra materials (attic stock), tools, devices, lubricants, fuels, signage, warnings, hazards, procedures for start-up, shut-down, and sequencing of systems, emergency and safety procedures, economy and

efficiency adjustments, energy conservation, protective features, warranties and maintenance agreements, performance bonds, and similar features of the completed Project.

3.04 WARRANTY ORIENTATION

A. Prior to Substantial Completion, the Contractor shall develop and conduct a warranty orientation at the Project Site to familiarize Government O&M personnel with the Contractor's warranty support program. Attendees shall include facilities support staff, facilities management staff, the General Services Officer, and others as designated by Project Director/COR.

B. Orientation shall include, but not be limited to:

1. Review of installed facilities, systems, and equipment.
2. Review of spare parts, special tools and equipment, and O&M manuals.
3. Discussion of warranties, nature and types of expected failures, expected mean time between failure (MTBF), and the methodologies to effect remediation under said warranty provisions, both locally and at successive levels.
4. Discussion of the follow-on training, maintenance, and warranty management services identified as Government deliverables through conclusion of the warranty period.
5. Discussion of the Maintenance Plan specified in Section 017825, *Operation and Maintenance Data*, maintenance documentation, and their relevance to the warranty management program.
6. Review of source documents, including Contract drawings, Specifications, and relevant change orders which might bear on warranty issues.

3.05 MAINTENANCE OF EQUIPMENT

A. Unless otherwise agreed by the Project Director/COR, the Contractor shall perform all preventive maintenance and equipment inspection required by the equipment manufacturer's O&M manuals, equipment warranties, and industry best practices until the date of Substantial Completion. The Contractor shall document all preventive maintenance and required maintenance inspections in detail and in individual equipment histories in the CMMS. All contractor preventative maintenance logs and records shall be turned over to the Project Director/COR as a formal submission prior to Substantial Completion date.

END OF SECTION

SECTION 019115
COMMISSIONING

PART 1 GENERAL

1.01 SUMMARY

This Section specifies the Contractor's responsibilities associated with the overall project start-up, testing, and commissioning process and informs the Contractor of the role the Government will take in such activities. This process is intended to facilitate the orderly transfer of properly operating equipment, systems, and buildings to beneficial use by the Government.

1.02 RELATED DOCUMENTS

A. Other general provisions of the Contract, including FAR clauses by reference or as amended in Contract Sections B through J, and other Division 1 Sections of these Contract Specifications apply to requirements of this Section. This Section in turn applies to the Contract Drawings and Technical Specifications.

B. Generic Commissioning Plan (Attachment 019115A and forms):

The Generic Commissioning Plan details the specific activities associated with the overall commissioning process for the project, the Commissioning Team members, and their roles and responsibilities within the commissioning process. The Generic Commissioning Plan serves as a guide for the creation of a project-specific Commissioning Plan by the Commissioning Agent.

C. US Green Building Council LEED Requirements:

Fundamental Commissioning (per EA prerequisite 1) and Enhanced Commissioning (per EA credit 3) shall be provided on this project.

1.03 COMMISSIONING TEAM

A. The Commissioning Team (Government and Contractor) consists of the following members:

1. Project Director/Contracting Officer's Representative (Project Director/COR)
2. Commissioning Agent (CxA)
3. Post Operations and Maintenance Staff (Post)
4. Contractor's Commissioning Representative
5. Commissioning Agent's Contracting Officer's Representative
6. Construction Executive/Alternate Contracting Officer's Representative (ACOR)

B. Contractor's Commissioning Representative: The Contractor shall assign a person from his field staff with a minimum of five (5) years experience in the

coordination of quality control aspects of building construction. The coordinator's responsibilities include:

1. Communication and coordination with Commissioning Agent (CxA)
2. Commissioning coordination meeting attendance
3. Commissioning planning
4. Commissioning scheduling
5. Oversight of Subcontractor commissioning activities
6. Coordination of PreFunctional Checklists and Functional Performance Test Procedures to assure no equipment, liability, or warranty issues arise.

Note: The term "commissioning" used above and throughout this document shall generally mean "start-up, testing, and commissioning."

C. Commissioning Agent (CxA):

1. The CxA will be the Government representative for commissioning and will perform the duties and tasks outlined below, reporting to and working under the authority of the Project Director/COR. On behalf of the Government, the CxA will coordinate, monitor, and report on the Contractor's commissioning progress.

2. The CxA will review the installation and function of all facility components and building systems.

3. The CxA will validate and document compliance of all products and processes related to the construction and close-out activities performed under this contract.

4. The CxA will develop a project-specific Commissioning Plan based on the Generic Commissioning Plan.

5. The CxA will review the Contractor-developed Commissioning Execution Plan to ensure compliance with technical Contract requirements.

6. The CxA will verify the integration of all start-up and commissioning activities within the Project Execution Schedule.

7. The CxA will attempt to anticipate issues, respond promptly, recommend applicable corrective action to Project Director/COR, and take all actions necessary to avoid project delays.

8. During Construction, the CxA will:

   a. Coordinate with the Contractor to establish a workable Commissioning Execution Plan.
   b. Review all design and/or construction submittals related to equipment and systems which must be commissioned.

c. Validate that all facility components and accessories are handled, stored, installed, and kept in clean condition.
d. Observe construction to verify actions and installation will facilitate successful commissioning.
e. Observe demonstration and sequencing of all facility component and building systems controls.
f. Review Quality Control documentation prepared and submitted in accordance with the Contractor's Quality Control Plan.
g. Verify that all applicable Operation and Maintenance data is included and packaged in accordance with Section 017825.
h. Verify that all applicable Operation and Maintenance data is assembled, checked, and validated in accordance with industry standards.
i. Prepare commissioning progress reports monthly and more frequently as needed.
j. Prepare Final Commissioning Report and its update.

9. During Project Completion and Closeout, the CxA will:

a. Verify that all facility components and building systems have been tested, adjusted, balanced, and commissioned in accordance with the Commissioning Plan. The CxA will also independently record test results and recommend acceptance to Project Director/COR.
b. Review and validate completeness and adequacy of demonstration and training in accordance with Section 017905, *Demonstration and Training*.
c. Complete and submit a final Commissioning Report to the Project Director/COR.

1.04 SUBMITTALS (related to Commissioning)

A. The Contactor's Project Manager shall submit the following information for the assigned Commissioning Representative:

1. Name
2. Title
3. Years of Experience
4. Phone Number
5. Pager or Cell Phone Number
6. E-Mail Address

B. The Contractor shall prepare and submit a detailed Commissioning Execution Plan detailing the logistics associated with performing and coordinating the Commissioning Plan requirements. The Commissioning Execution Plan shall include, but not be limited to, the following:

1. Names, contact information, and roles and responsibilities of all Commissioning Team members.

2. A list of all systems to be commissioned and equipment and components that make up those systems.
3. A sequence of commissioning activities and the plan for coordinating them with other specified Contractor responsibilities and deliverables.

C. The Contractor shall submit a single electronic version of the Maintenance Library (per Division 1 specification section “Operation and Maintenance Data”) to the Project Director/COR for review within four (4) months after all submittals related to systems to be commissioned have been accepted. After review and approval of this single set, the full quantity of Maintenance Library documentation shall be submitted to the Owner. The final Maintenance Library shall be submitted to the Project Director/COR prior to the first scheduled equipment training session.

D. The Contractor shall submit the Operations and Maintenance Library in accordance with Section 017825.

E. The Contractor shall submit equipment training items in accordance with Section 017905.

F. Equipment Start-up and Energization Submittals:

1. The Contractor shall submit a list of Equipment Start-up and Energization procedures to the Project Director/COR no later than eight (8) weeks after the Construction NTP.
2. The Contractor shall submit Equipment Start-up and Energization procedures and report formats to the Project Director/COR no later than eight (8) weeks after acceptance of associated equipment submittals. Equipment Start-up and Energization shall not commence until the Project Director/COR has reviewed and accepted the proposed procedures and report formats.
3. The Contractor shall submit Equipment Start-up and Energization reports to the Project Director/COR within one (1) week of successful completion of each procedure.

G. Quality Control Tests Submittals:

1. The Contractor shall submit a list of Quality Control Test procedures to the Project Director/COR no later than eight (8) weeks after the Construction NTP. Refer to Paragraph 3.03 for Quality Control Tests that must be documented.
2. The Contractor shall submit Quality Control Test procedures and documentation formats to the Project Director/COR no later than eight (8) weeks after acceptance of associated equipment submittals. Quality Control testing shall not commence until the Project Director/COR has reviewed and accepted the proposed procedures and documentation formats.
3. The Contractor shall submit Quality Control Test reports to the Project Director/COR within one (1) week of successful completion of each test.
4. The Contractor shall submit a complete list of test equipment, instruments, testing devices, gauges, etc., that are required to be

calibrated for their use in start-up, testing, and commissioning. The list will include dates of most recent calibration and date re-calibration will be required to meet certification standards. This register shall be maintained throughout the duration of the project, a copy attached to each Quality Control Test Report requiring use of calibrated equipment, and a final register submitted with the Commissioning Functional Test Reports.

H. The Contractor shall submit the Functional Performance Testing schedule to the Project Director/COR at least eight (8) weeks prior to the start of testing.

I. The Contractor shall submit the completed Prefunctional Checklist to the Project Director/COR upon completion and at least one (1) week before Functional Performance Testing. System Functional Performance Testing shall not commence until testing readiness is documented through submission of the fully executed Prefunctional Checklist

J. Prior to commencement of electrical system Functional Performance Testing, the Contractor shall submit the final accepted Short Circuit/Coordination/Arc Flash Study to the Project Director/COR. The Contractor shall apply the accepted settings to protective devices.

K. The Contractor shall submit complete Training Agendas in accordance with Section 017905 no later than two (2) weeks prior to the delivery of each training session.

L. The Contractor shall submit HVAC Test and Balance Reports at least thirty (30) days prior to the scheduled request for substantial completion.

M. The Contractor shall submit software documentation and appropriate media discs. Media discs must contain basic programming and customized files that can restore all commissioned systems to their operating state.

N. The Contractor shall provide Record Documentation for review per specification Section 017705.

1.05 SYSTEMS AND EQUIPMENT TO BE COMMISSIONED

A. Building Systems and Equipment:

See Commissioning Table at the end of this Section.

B. Government Systems:

The systems listed below all will ultimately be commissioned by the Government. All have infrastructure elements (such as wiring) provided by the Contractor that require testing and confirmation of proper performance and interface for those systems per applicable specifications.

1. Antennae
2. FEBR Doors and Windows
3. Telephones
4. Security Systems

5. Fire Systems
6. Radio Rooms/Radios
7. Local Computer Network
8. Systems Furniture
9. Elevators

1.06 INTEGRATION OF COMMISSIONING ACTIVITES

A. The Contractor shall take every precaution to avoid unnecessary delays in occupancy by ensuring full integration of all proposed commissioning work elements.

1.07 COMMISSIONING DOCUMENTATION, DISTRIBUTION, AND REVIEW

A. The Contractor will receive commissioning Prefunctional Checklists and Functional Test Procedures (developed by the CxA) from the Project Director/COR. All parties associated with the systems being commissioned shall have an understanding of the work requirements, performance measures, and operating standards.

B. The Contractor shall review and comment on the Functional Performance Test Procedures based on accepted shop drawings and submittals. Through direct communication and coordination between the Contractor's Commissioning Representative and the CxA, the Contractor shall acknowledge that the PreFunctional Checklists and the Functional Performance Test Procedures agreed to be used, have been vetted and accepted by affected parties (such as manufacturers, suppliers, subcontractors, etc.) as creating no equipment liability or warranty issues**.**

C. The Contractor shall review the Final Commissioning Report prepared by the CxA and provided at Substantial Completion.

D. The Contractor shall participate in the Best Practices meeting to be held within 4 weeks of Substantial Completion.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. The Contractor shall provide the test equipment required to complete the Functional Performance Tests.

B. Instrumentation shall meet the following performance standards:

1. Be of sufficient quality and accuracy to test and measure the system performance within the tolerances required.
2. Be calibrated at the manufacturer's recommended intervals with calibration tags permanently affixed to the instrument.
3. Be maintained in good repair and operating condition.

4. Be immediately re-calibrated or repaired, if damaged in any way during project system testing.

PART 3 EXECUTION

3.01 COMMISSIONING SCHEDULING

A. The Contractor shall not provide a separate commissioning schedule but shall include at least the following commissioning activities integrated in the Project Execution Schedule (PES):

1. Construction Phase Commissioning items shall be incorporated into the PES no later than four (4) weeks after the Construction NTP:

   a. Draft Commissioning Execution Plan
   b. Major Equipment Start-up and Energization list submission.
   c. Major Equipment Start-up and Energization procedures and report format submission.
   d. Quality Control Testing procedures and documentation format submission.
   e. Training agendas submission.
   f. Maintenance Library submission.
   g. GMMS Template submission.
   h. Updated Commissioning Execution Plan (240 days before Substantial Completion).

2. Acceptance & Turnover Phase items shall be incorporated into the PES no later than (8) weeks after acceptance of all submittals for systems to be commissioned:

   a. Major Equipment Start-up and Energization execution.
   b. Quality Control testing execution.
   c. Testing, adjusting, and balancing.
   d. Equipment training sessions.
   e. Prefunctional Checklist completion.
   f. Functional Performance Testing.
   g. Deficiency correction.
   h. Functional Performance re-testing (as necessary).

3. Transition Phase items shall be incorporated into the PES no later than Substantial Completion:

   a. Opposite season functional performance testing.

3.02 EQUIPMENT START-UP & ENERGIZATION

A. The Contractor shall submit a list of major equipment start-up and energization procedures for commissioned Building Systems and Equipment to the Project Director/COR.

B. The Contractor shall submit start-up procedures and report formats for each piece of major equipment to the Project Director/COR for review and acceptance. Start-up and energization procedures shall not commence until Project Director/COR acceptance has been received in writing.

C. The Contractor shall inform the Project Director/COR two (2) weeks in advance of the start-up and energization of individual pieces of equipment. The CxA reserves the right to witness any and all start-up and energization procedures.

D. The Contractor shall submit documentation of each successful equipment start-up and energization procedure to the Project Director/COR.

3.03 QUALITY CONTROL TESTS

A. Refer to Section 014010, Contractor's Quality Control.

B. The Contractor shall submit quality control testing procedures and report formats for commissioned Building Systems and Equipment to the Project Director/COR for review and acceptance. Quality control testing procedures shall not commence until Project Director/COR acceptance has been received in writing. At a minimum, the tests shall include the systems listed in the Commissioning Table below.

C. The Contractor shall inform the Project Director/COR two (2) weeks in advance of the Quality Control testing schedule. The CxA reserves the right to witness any and all test procedures.

D. The Contractor shall submit Contractor's Quality Control test documentation to the Project Director/COR following successful completion of each test.

3.04 PREFUNCTIONAL CHECKLISTS

A. The Contractor shall complete Prefunctional Checklists for each commissioned Building System and Equipment item and each commissioned Government System (See paragraph 1.05).

B. Customized and detailed Pre-functional Checklists shall be provided by the CxA except for the Government Systems (see paragraph 1.05.B) checklists that will be provided by the Government.

C. Prior to Functional PerformanceTesting, and in addition to verifying that all equipment and associated hardware is installed properly, the Contractor shall perform and document sensor calibration or provide documentation verifying manufacturer's performance of calibration. A sensor is defined as any device that measures a system parameter for control purposes or monitors the system performance. The CxA reserves the right to observe sensor calibration procedures.

D. The Contractor shall submit fully executed Prefunctional Checklists to the Project Director/COR upon completion of each checklist. System Functional Performance Testing shall not commence until testing readiness is confirmed

and documented. There is a one-to-one system correspondence between Prefunctional Checklists and Functional Test Procedures.

3.05 FUNCTIONAL PERFORMANCE TESTS

A. The Contractor is responsible for Functional Performance Testing of commissioned Building Systems and Equipment. The Government is responsible for Functional Performance Testing of Government Systems.

B. Customized Functional Performance Test procedures for Building Systems and Equipment, establishing level of detail and acceptance criteria, (developed by the CxA) will be provided by the Project Director/COR..

C. The Contractor shall provide personnel and equipment for the performance of the Building Systems and Equipment Functional Performance Test procedures. These procedures shall be performed under the observation of the CxA.

D. There shall be a Functional Performance Test procedure for each system and equipment item listed under Building Systems and Equipment in the Commissioning Table below.

3.06 DEFICIENCY TRACKING/CORRECTIVE ACTION

A. The Contractor shall perform corrective actions for resolution of deficiencies found during:

1. Equipment Start-up or Energization.
2. Contractor Quality Control Testing.
3. Test, Adjust, and Balance.
4. Prefunctional Checkout.
5. Functional Performance Testing.

B. During Functional Performance Testing, a deficiency is generally defined as a system feature that does not function as expected and cannot be corrected without disrupting the commissioning process.

C. The Contractor shall report each deficiency and subsequent completion of each corrective action to the Project Director/COR and schedule retesting to demonstrate successful correction of each deficiency.

3.07 COMMISSIONING TABLE

A. In collaboration with the Commissioning Team, the CxA will develop a table of Building Systems and Equipment, appropriate for this project, to which the Fundamental and Enhanced Commissioning process shall apply, as defined in applicable LEED documents and this specification section. The CxA will have a key role in assuring that all elements of proper building commissioning are performed on this project.

B. The list of project Systems will typically include HVAC, building management, central heating/cooling plant, plumbing, emergency and normal power, elevator, fire, technical security, communications and roofing. The project Commissioning Plan, developed by the CxA, will provide the comprehensive compilation of appropriate Systems and appropriate level of process detail to enable the Contractor to commission those Systems properly. Any integrated Systems tests such as total loss/restoration of power will also be included.

C. Specification List

The list of project Equipment specifications below is related to the building commissioning process. This list shall be modified to delete inapplicable items and add new appropriate items as the project needs dictate. Note that the numbered items below are mandatory OBO specification sections, if applicable to this project.

D. Table:

DIVISION 07 – THERMAL AND MOISTURE PROTECTION
Membrane Roofing

DIVISION 10 – SPECIALTIES
101465 Automatic Queuing System

DIVISION 11 – EQUIPMENT
114005 Food Service Equipment
115355 Class 1 Biological Safety Cabinet

DIVISION 13 – SPECIAL CONSTRUCTION
133435 Mail Screening Facilities
Swimming Pool

DIVISION 14 – CONVEYING EQUIPMENT
Elevators
Vehicle lifts

DIVISION 21 – FIRE SUPPRESSION
211305 Fire Sprinkler Systems
213115 Fire Pump Assemblies
Motors for fire suppressions equipment

DIVISION 22 – PLUMBING
223230 Potable Water Treatment
224105 Residential Plumbing Fixtures
224215 Commercial Plumbing Fixtures
224500 Emergency Plumbing Fixtures
Building Storm Drainage Piping
Meters and Gages for Plumbing Piping
Vibration and Seismic Controls for Plumbing Piping and Equipment
Plumbing Specialties

Domestic Water Piping
Domestic Water Packaged Booster Pumps
Sanitary Waste and Vent Piping
Sanitary Sewerage Pumps
Sumps Pumps
Electric Water Heaters
Drinking Fountains and Water Coolers

DIVISION 23 – HVAC
230719 HVAC Piping Insulation
230905 Instrumentation and Controls for HVAC
234105 Air Filtration
Chillers
- 236422 Dedicated Heat Recovery Chillers
- 236424 Modular Scroll Air-Cooled Water Chillers
- Other types as design requires

237315 Central Station Air-Handling Units
Building Fuel Oil Piping
Building Natural Gas Piping
Split-System Air Conditioners
Testing, Adjusting, and Balancing for HVAC
Duct Insulation
Common Motor Requirements for HVAC Equipment
Meters and Gages for HVAC Piping
Heat Tracing for HVAC Piping
HVAC Equipment Insulation
Hydronic Piping
Hydronic Pumps
Refrigerant Piping
HVAC Water Treatment
HVAC Power Ventilators
Air Terminal Units
Boilers
Heat Exchangers for HVAC
Refrigerant and Monitoring Safety Equipment
Computer Room Air Conditioners
Fan-Coil Units
Convectors
Unit Heaters
Humidifiers

DIVISION 26 – ELECTRICAL
260126 Field Testing and Inspection of Electrical Systems
260505 Common Work Results for Electrical, Communications, and Electronic Safety
260573 Overcurrent Protective Device Coordination Study
260913 Electric Power Monitoring
262300 Low-Voltage Switchgear
262313 Paralleling Switchgear
262315 Double-Ended Switchgear

263105 Solar Photovoltaic Systems
263214 Engine Generators
263354 Joint-user Computer Room (JUCR) Uninterruptible Power Supply (UPS)
263551 TSS Voltage Regulators
263552 Low-Voltage Automatic Voltage Regulators
263553 Medium-Voltage Automatic Voltage Regulators
264315 Surge Protective Devices
265615 Undercarriage Vehicle Inspection Lighting
Grounding and Bonding for Electrical Systems
Low-Voltage Electrical Power Conductors and Cables
Medium-Voltage Cables
Cable Trays
Vibration and Seismic Controls for Electrical Systems
Lighting Control Devices
Dimming Controls
Secondary Unit Substations
Medium-Voltage Transformers
Medium-Voltage Switchgear
Low-Voltage Transformers
Switchboards
Panelboards
Motor-Control Centers
Wiring Devices
Fused Power Circuit Devices
Enclosed Switches and Circuit Breakers
Enclosed Controllers
Variable Frequency Motor Controllers
Power Factor Correction Equipment
Resistive Load Bank
Transfer Switches
Lightning Protection
Interior Lighting
Exterior Lighting

DIVISION 27 – COMMUNICATIONS
270526 Grounding and Bonding For Communications Systems
270528 Surface-Mounted Raceways for Communications Systems
271113 Communications Entrance Protection
271119 Communications Termination Blocks and Patch Panels
271305 Communications Backbone Cabling
271505 Communications Horizontal Cabling
272129 Data Communication Switches and Power Supplies
275105 Audio Systems for Consular Services
275115 Mass Notification Systems
275121 TSS Intercommunications System
Non-Consular Teller Intercommunications Systems
Nurse Call System

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
280560 Common Work Results for Technical Security Systems (TSS)

280570 Security Management System Enterprise (SMSE)
281305 Technical Security Access Systems
281354 Technical Security Access Equipment
281605 Technical Security Intrusion Detection Systems
282305 Technical Security CCTV Systems
282605 Technical Security Duress Systems
283115 Addressable Fire Alarm Systems
285105 Technical Security Chemical Dispensing Systems

DIVISION 32 – EXTERIOR IMPROVEMENT
324005 Anti-Climb Gate Systems
324006 Anti-Ram Gate Systems
324007 Active Roadway Barrier Systems
324008 Hydraulic Bollard Barricade Systems
324009 Crash-Rated Drop Arm Systems
Planting Irrigation

DIVISION 33 – UTILITIES

END OF SECTION

OBO Generic Commissioning Plan

--Pre-Design to Transition Phase--

Table of Contents

OBO Generic Commissioning Plan

0. Preface

This Generic Commissioning Plan is the Overseas Buildings Operations Commissioning Process and is to be followed as outlined here on all OBO major construction projects. This plan outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process. It includes description of each Commissioning Activity, the schedule integration with the design and construction of the project, and the roles and responsibilities of each of the Commissioning Team Members. Any deviation from this plan must be coordinated and approved by the OBO Commissioning Branch.

This Generic Plan lays out the process in a Design-Build (D-B) context but shall be used for a Design-Bid-Build (D-B-B) process since the commissioning process is fundamentally the same for both.

To use this Generic Plan for an OBO D-B-B project, one needs to modify two main aspects defined herein. The first aspect is to recognize that the term 'Contractor' means the Architect/Engineer of Record (A/E) for the project during the design phase and the Construction Contractor during the construction phase. The second aspect is that the Basis of Design created by the A/E must be updated by a responsible party to include all changes during the construction phase. As a general rule, the A/E assigned for Title II consulting services shall update the Basis of Design. Otherwise the Commissioning Agent or OBO will update the Basis of Design. Updating of the Basis of Design will be coordinated with the construction contractor.

1. Overview

A. Purpose of the Commissioning Plan

The Commissioning Plan defines the process on Design-Build Projects for verifying that the building systems are designed, installed, functionally tested and capable of being operated and maintained according the U.S. Government's requirements. Accordingly this document will outline for the Commissioning Team Members the organization and management for the execution of the required Commissioning Plan.

The purpose of the OBO Generic Commissioning Plan is to provide direction for the initialization of commissioning process during design and construction, particularly providing resolution for issues and providing details that cannot be, or were not, fully developed during pre-design, such as scheduling, participation of various parties of this particular project, actual lines of reporting and approvals, coordination, etc.

Commissioning is a quality-focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the Owner's Project Requirements.

B. Abbreviations and Definitions

Contractor	Design and Construction Contractor
CxA	Commissioning Agent
CxCOR	Commissioning Agent's Contracting Officer's Representative
OBO	Overseas Buildings Operations

OPR	Owner's Project Requirements
PD/COR	Project Director / Contract Officer's Representative (for construction)
FM	Facility Manager
SED	Standard Embassy Design
NTP	Notice to Proceed
IFC	Issued for Construction

C. Related Documents

i. Owner's Project Requirements

ii. SED Drawings and Specifications

iii. Specification Section 019115 *Commissioning*

iv. Sensitive System Government Involvement and Quality Control

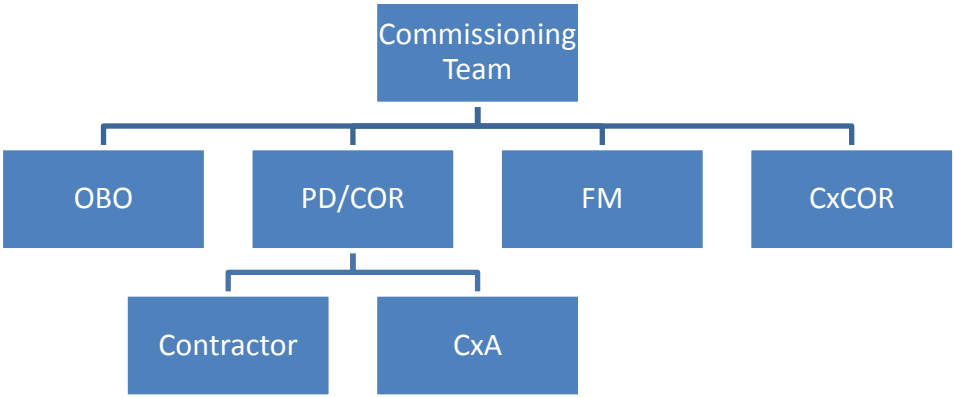
The construction of Department of State overseas facilities includes certain physical/technical security requirements such as perimeter walls, vehicle and pedestrian barriers, FEBR products and security related communication systems. The security related items are sensitive to the extent that they require the owner to perform specialized surveillance, inspection, testing, measuring, reporting and correction of defects. During the construction, the U.S. Government will conduct site visits for the purpose of the physical and technical equipment accreditation, in addition to the commissioning of the security installation. The Contractor is required to submit a CQC Plan that will acknowledge the QC responsibilities for implementing quality control integration and progress into the security construction process.

Specification Section 014005, Quality Control Procedures shall be implemented by the General Contractor and the related quality assurance procedures performed by the United States Government to ensure that fabricated materials/equipment/systems comply with the contract documents. In general, the Contractor shall be responsible for the conventional testing and inspection of materials and systems to ensure total quality of the works.

2. Commissioning Team Members

The members of the commissioning team consist of representatives from OBO, the Commissioning Agent, the Contractor, the FM and the Project Director/Contracting Officer's Representative. While there are a number of people from each organization that will be involved in Commissioning, this plan does not delineate the responsibilities any further than to the commissioning team member itself. It will be up to each commissioning team member to determine how they will execute the responsibilities outlined in this plan to the participants.

A. Commissioning Team Member Organizational Chart



B. Commissioning Team Member Table

Commissioning Team Members	Potential Participants from each Team
OBO	PDCS/Project Development and Coordination
	PDC /Design and Engineering
	CFSM/Construction Management
	CFSM/ Facilities Management
CxA	Commissioning Agent - Consultant to OBO/CFSM/CM
CxCOR	CFSM/CM/COM - Commissioning Branch's Contracting Officer's Representative for the Commissioning Agent
Contractor	Design Engineers / Architects
	Construction Manager
	Commissioning Representative
	Mechanical Contractor
	Plumbing Contractor
	Electrical Contractor
	Controls Contractor
	Fire Alarm Contractors
	Security Contractor
	Testing, Adjusting & Balancing Contractor
FM	Facility Manager
PD/COR	Design Architect (OBO/PDC/DE in the Design Phase)
	Project Director / Contracting Officer's Representative (OBO/CFSM/CM in the Construction, Acceptance & Turnover and Transition Phases)

C. Commissioning Management Protocols

The following protocols will be used on this project. Note that the CxA reports to and works under the authority of the CxCOR during the design phase and the PD/COR during the construction phase of the project.

Issue Protocol

For requests for information (RFI) or formal documentation requests:	The CxA goes to the CxCOR for design issues and to the PD/COR for construction issues.
For minor or verbal information and clarifications:	The CxA goes direct to the informed party.
For notifying contractors of deficiencies:	The CxA documents deficiencies through the CxCOR for design issues or the PD/COR for construction issues, but may discuss deficiency issues with contractors prior to notifying the appropriate COR.
For scheduling functional tests or training:	The minimum required milestones are included in specification section 019115. The CxA may recommend additional milestones to be added.
For scheduling commissioning meetings:	The CxA proposes the dates and coordinates with the Contractor and appropriate COR. The CxA schedules and notifies attendees directly.
For making a request for significant changes:	The CxA has no authority to issue change orders.
For making small changes in specified sequences of operations:	The CxA may recommend small sequences of operations changes to improve efficiency or control or to correct deficiencies, through the responsible contractor, but shall document the change and provide all changes of specified sequences to the PD/COR and Contractor for their concurrence. The Contractor shall document these changes in the Record Documents. The CxA may not make changes to specified sequences without approval from the PD/COR.
For Subcontractor disagreements with requests or interpretations by the CxA:	The CxA will work through the PD/COR resolutions.

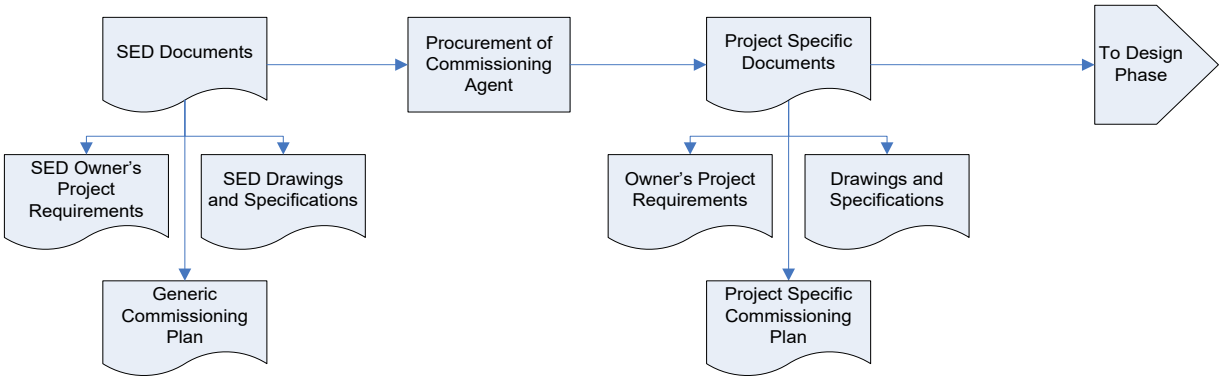
Additional protocols regarding the flow of documents and the commissioning process are shown in Appendix 2.

3. Commissioning Process

Commissioning Process Flowcharts

Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

Pre-Design Phase



Developed and maintained by OBO

Provided to the Contractor

Available to Commissioning Agent

OBO Procures Commissioning Agent

Commissioning Agent reviews project documentation

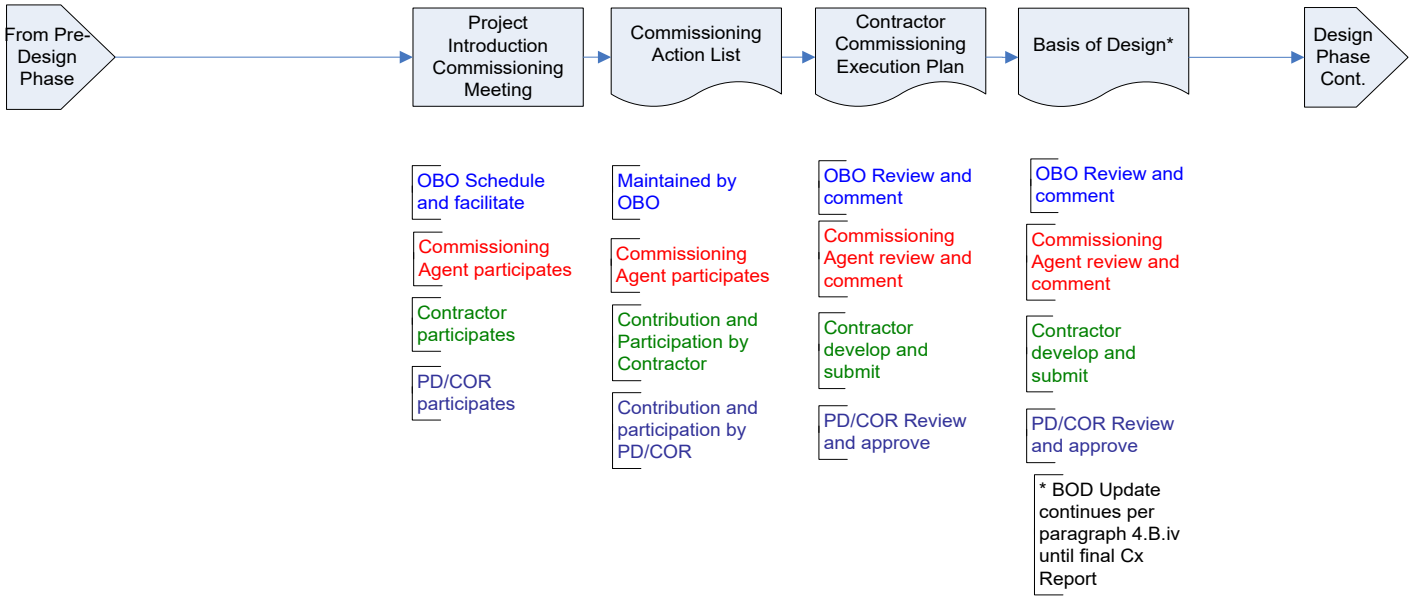
Developed and maintained by OBO

Provided to the Contractor

Commissioning Agent prepares Commissioning OPR; Begins preparing Commissioning Plan

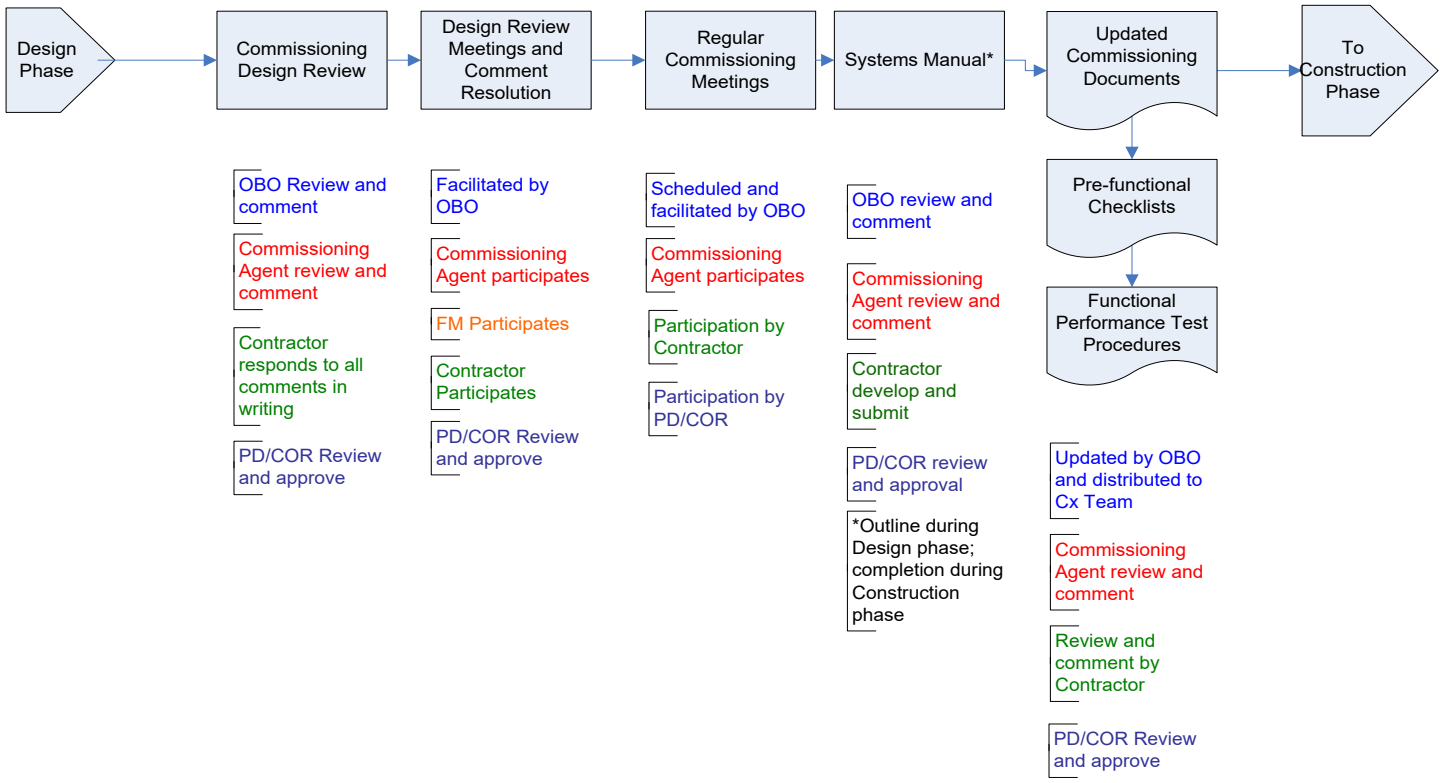
Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

Design Phase



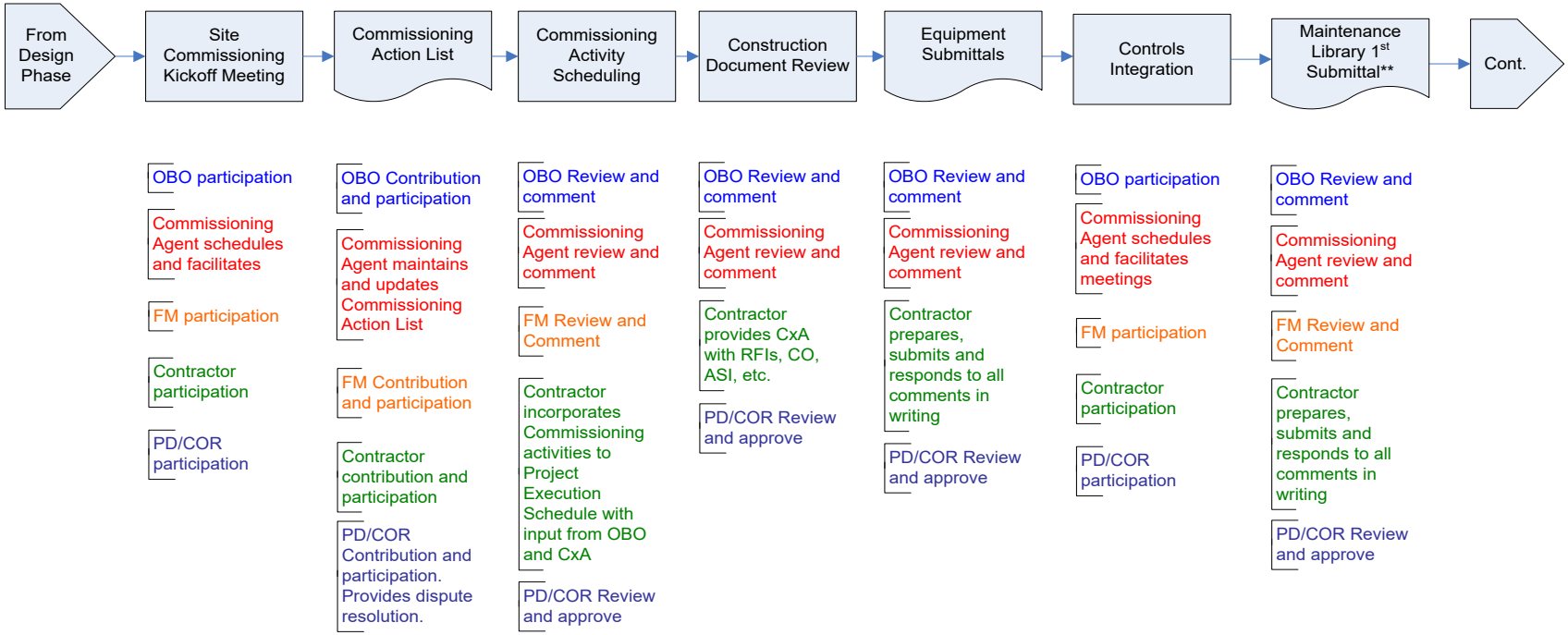
Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

Design Phase Continued



Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

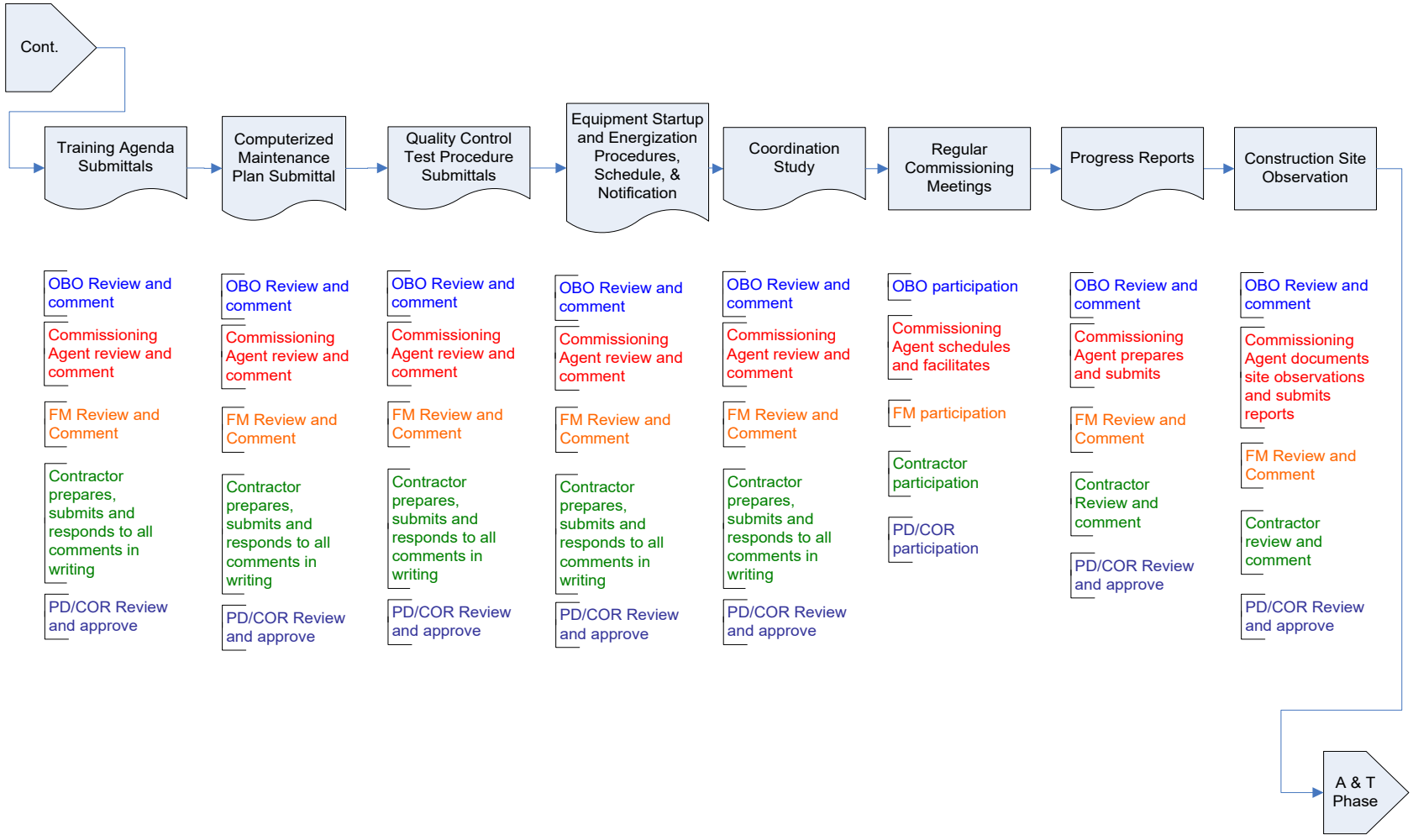
Construction Phase

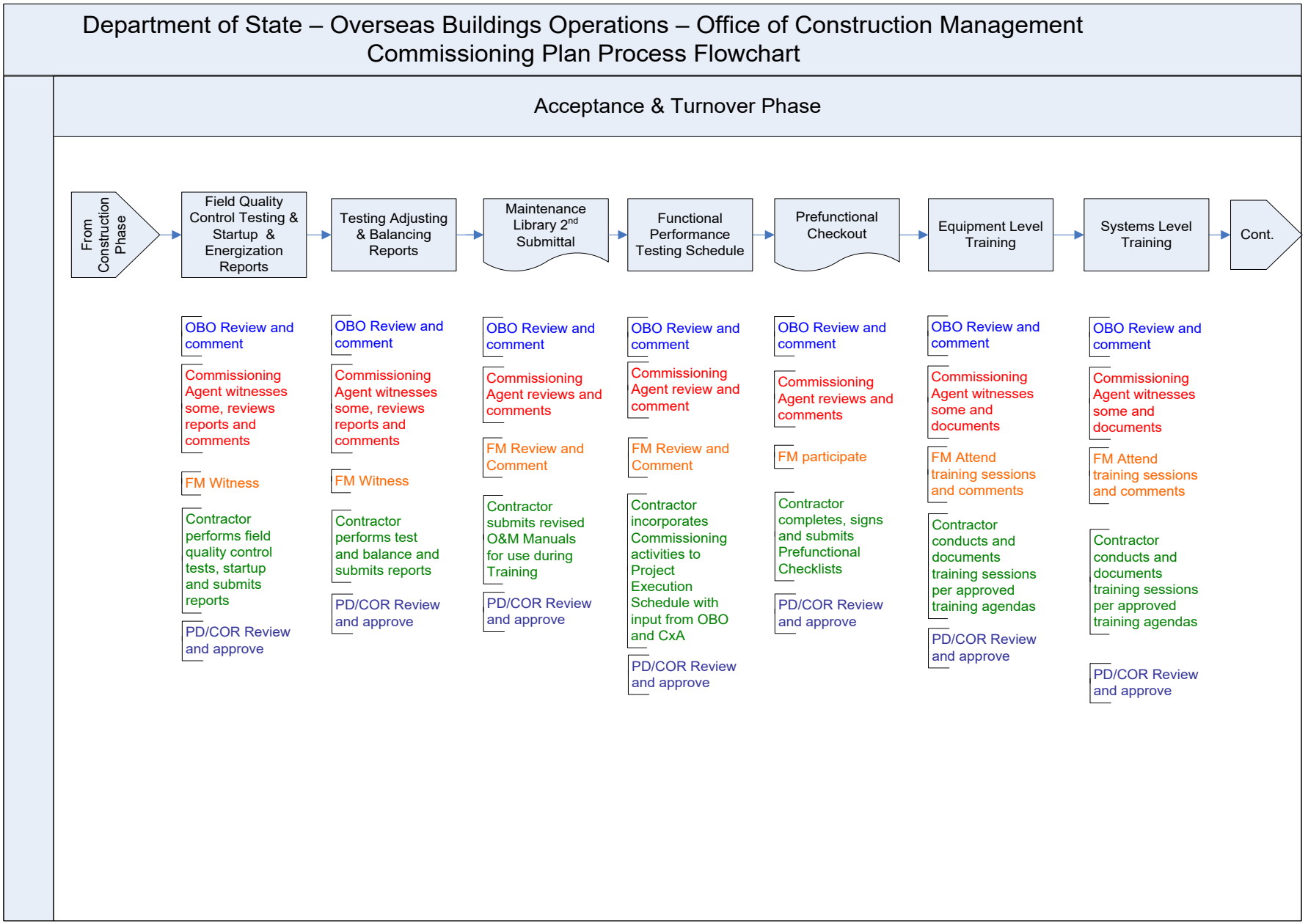


** Reference Specification Section 01781 "Operations and Maintenance Data" for maintenance schedule, spare parts listing and special tool requirements.

Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

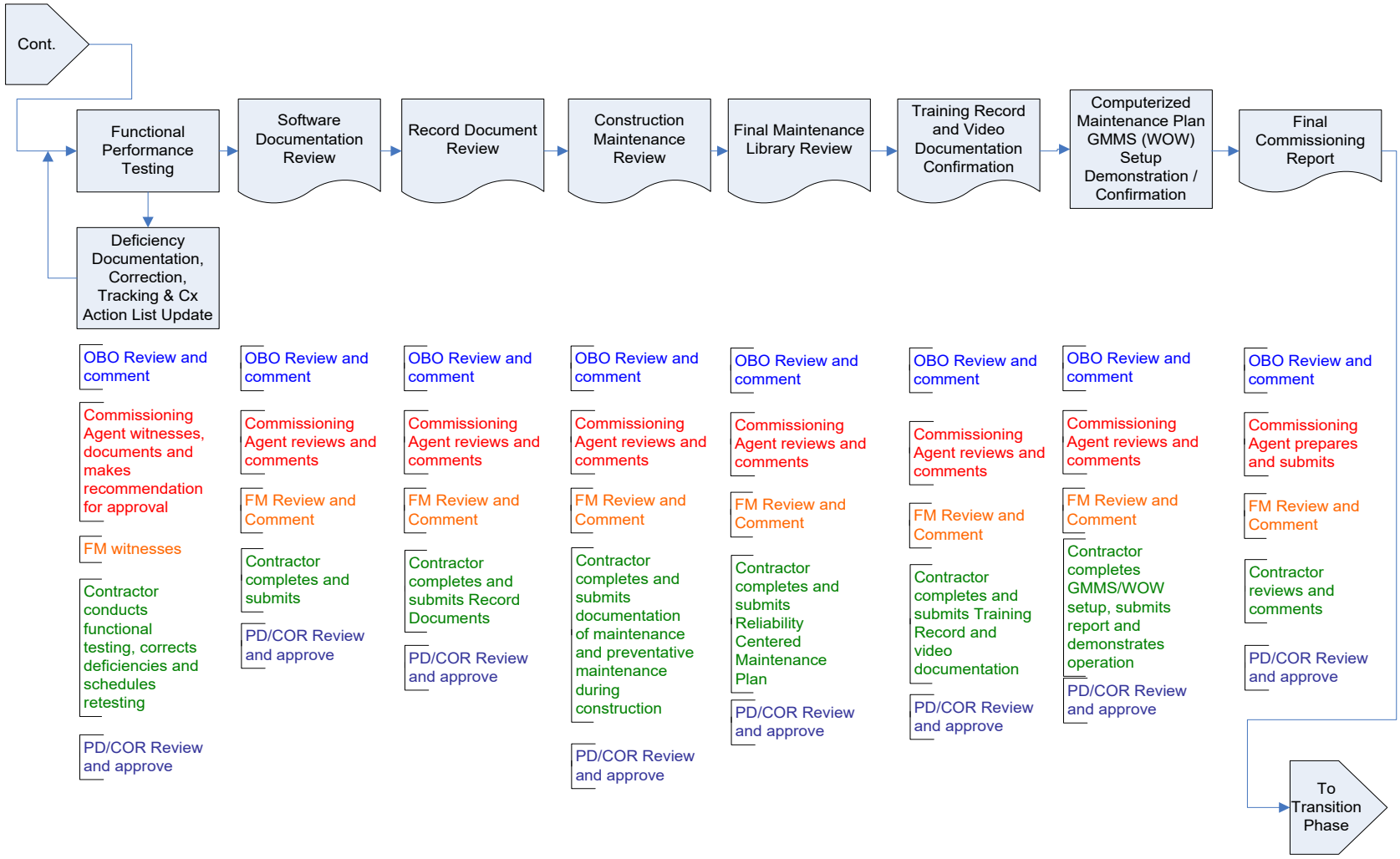
Construction Phase Continued




Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart
Acceptance & Turnover Phase
From Construction Phase
Field Quality Control Testing & Startup & Energization Reports
Testing Adjusting & Balancing Reports
Maintenance Library 2nd Submittal
Functional Performance Testing Schedule
Prefunctional Checkout
Equipment Level Training
Systems Level Training
Cont.
OBO Review and comment
Commissioning Agent witnesses some, reviews reports and comments
FM Witness
Contractor performs field quality control tests, startup and submits reports
PD/COR Review and approve
OBO Review and comment
Commissioning Agent witnesses some, reviews reports and comments
FM Witness
Contractor performs test and balance and submits reports
PD/COR Review and approve
OBO Review and comment
Commissioning Agent reviews and comments
FM Review and Comment
Contractor submits revised O&M Manuals for use during Training
PD/COR Review and approve
OBO Review and comment
Commissioning Agent review and comment
FM Review and Comment
Contractor incorporates Commissioning activities to Project Execution Schedule with input from OBO and CxA
PD/COR Review and approve
OBO Review and comment
Commissioning Agent reviews and comments
FM participate
Contractor completes, signs and submits Prefunctional Checklists
PD/COR Review and approve
OBO Review and comment
Commissioning Agent witnesses some and documents
FM Attend training sessions and comments
Contractor conducts and documents training sessions per approved training agendas
PD/COR Review and approve
OBO Review and comment
Commissioning Agent witnesses some and documents
FM Attend training sessions and comments
Contractor conducts and documents training sessions per approved training agendas
PD/COR Review and approve

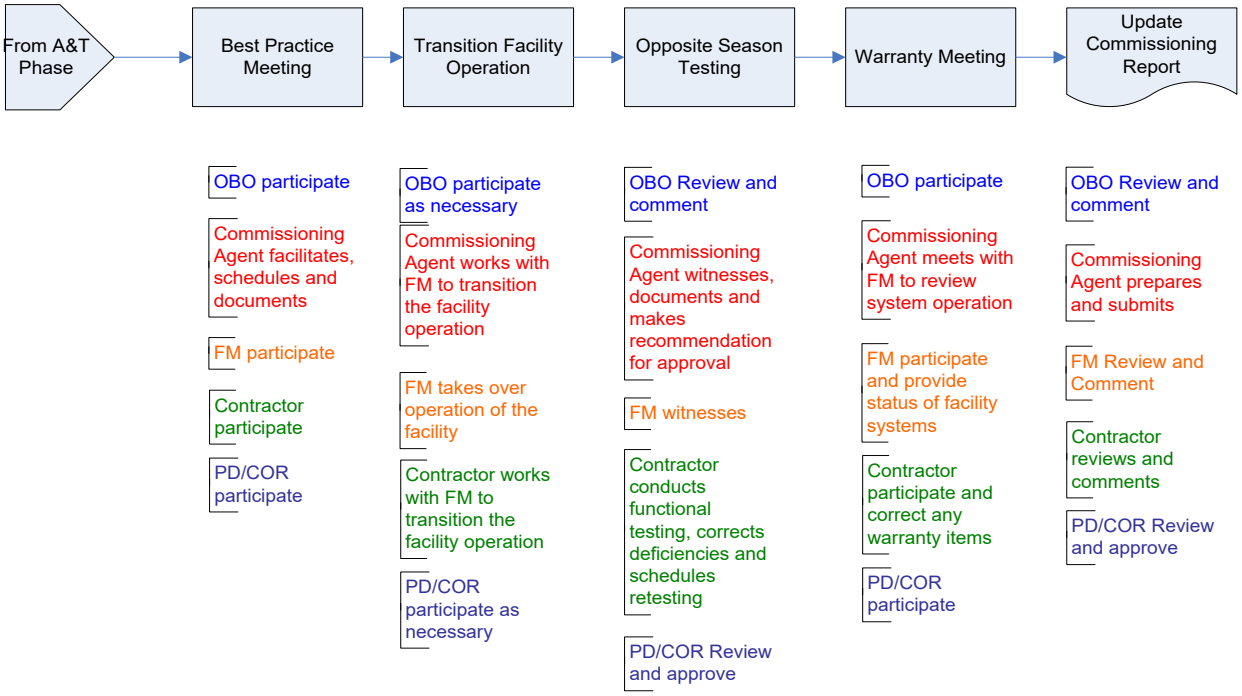
Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

Acceptance & Turnover Phase Cont.



Department of State – Overseas Buildings Operations – Office of Construction Management
Commissioning Plan Process Flowchart

Transition Phase



A. Commissioning Responsibility Matrix

Responsibility Key:	A=Approve	P=Participate				
	C=Conduct & Document	R=Review and Comment				
	D=Develop	W=Witness and Report				
	F=Facilitate	* = It is unclear if the CxA will be on-site during these activities.				

Phase	Activity	OBO	CxA	FM	Contractor	PD/COR
Pre-Design Phase	SED Documents	D	R			R
	Project Specific Documents	D	R			R
Design Phase	Hiring of Commissioning Agent (if not during pre-design)	F				
	Project Introduction Commissioning Meeting	F	P		P	P
	Commissioning Action List		D		P	A
	Contractor Commissioning Execution Plan	R	R		D	A
	Basis of Design and System Manual Outline	R	R		D	A
	Commissioning Design Review	R	R		D	R
	Design Review Meeting and Comment Resolution	P	P		F	P
	Regular Commissioning Meetings	F	P		P	P
	Update Commissioning Documentation					
	• Commissioning Plan	R	D		R	R, A
	• Training Requirements	R	D		R	R, A
	• Prefunctional Checklists	R	D		R	R, A
	• Functional Performance Test Procedures	R	D		R	R, A

Responsibility Key:	A=Approve	P=Participate				
	C=Conduct & Document	R=Review and Comment				
	D=Develop	W=Witness and Report				
	F=Facilitate	* = It is unclear if the CxA will be on-site during these activities.				

Phase	Activity	OBO	CxA	FM	Contractor	PD/COR
	Site Commissioning Kickoff Meeting	F	*P	P	P	P
	Commissioning Action List	P	*D	P	P	A
	Commissioning Activity Scheduling	R	*R	R	D	A
	Construction Document Review	R	*R		D	A
	Equipment Submittals	R	*R		D	A
Construction	Controls Integration	F	*P	P	P	P
	Maintenance Library 1st Submittal	R	*R	R	D	A
	Training Agenda Submittals	R	*R	R	D	A
	Computerized Maintenance Plan (CMP) Submittal	R	*R	R	D	A
	Quality Control Test Procedure Submittals	R	*R	R	D	A
	Equipment Startup and Energization Schedule Submittals	R	*R	R	D	A
	Coordination Study	R	*R	R	D	A
	Regular Commissioning Meetings	P	*F	P	P	P
	Progress Reports	R	*D	R		A
	Site Observation	R	*W	W	R	R
	Update Basis Of Design and complete Systems Manual	R	R	R	D	A

Responsibility Key:		A=Approve	P=Participate				
		C=Conduct & Document	R=Review and Comment				
		D=Develop	W=Witness and Report				
		F=Facilitate	* = It is unclear if the CxA will be on-site during these activities.				
Phase	**Activity**		**OBO**	**CxA**	**FM**	**Contractor**	**PD/COR**
	Site Commissioning Kickoff Meeting		P	*F	P	P	P
	Commissioning Action List		P	*D	P	P	P
	Commissioning Activity Scheduling		R	*R	R	D	A
	Construction Document Review		R	*R		D	A
	Equipment Submittals		R	*R		D	A
Construction	Controls Integration		P	*F	P	P	P
	Maintenance Library 1st Submittal		R	*R	R	D	A
	Training Agenda Submittals		R	*R	R	D	A
	Computerized Maintenance Plan (CMP) Submittal		R	*R	R	D	A
	Quality Control Test Procedure Submittals		R	*R	R	D	A
	Equipment Startup and Energization Schedule Submittals		R	*R	R	D	A
	Coordination Study		R	*R	R	D	A
	Regular Commissioning Meetings		P	*F	P	P	P
	Progress Reports		R	*D	R		A
	Site Observation		R	*W	W	R	R

Responsibility Key:		A=Approve	P=Participate				
		C=Conduct & Document	R=Review and Comment				
		D=Develop	W=Witness and Report				
		F=Facilitate	* = It is unclear if the CxA will be on-site during these activities.				

Phase	Activity	OBO	CxA	FM	Contractor	PD/COR
Acceptance & Turnover Phase	Field Quality Control Testing & Startup Reports	R	W,R	W	C	A
	Testing, Adjusting & Balancing Reports	R	W,R	W	C	A
	Maintenance Library 2nd Submittal	R	R	R	D	A
	Functional Performance Testing Schedule	R	R	R	D	A
	Pre-functional Checkout	R	R	W	C	A
	Equipment Level Training	R	W	P	C	A
	Systems Level Training	R	W,R	P	C	A
	Functional Performance Testing	R	W,R	P	C	A
	Software Documentation Review	R	R	R	D	A
	Record Drawing Review	R	R	R	D	A
	Construction Maintenance Review	R	R	R	D	A
	Maintenance Library Final Submittal	R	R	R	D	A
	Training Record and Video Documentation Confirm.	R	R	R	D	A
	Computerized Maintenance Plan - GMMS (WOW) Setup Demonstration /Confirmation	R	R	R	D	A
	Final Commissioning Report	R	D	R	R	A
Transition Phase	Best Practice Meeting	P	F	P	P	P
	Transition Facility Operation	P	F	P	P	P
	Opposite Season Testing	R	W,R	P	C	A
	Warranty Meeting	P	F	P	P	P
	Update Commissioning Report	R	D	R	R	A

B. Commissioning Activity Schedule Matrix

Activity / Deliverable	Required Forms from Appendix 1	Due	Review Comments Due	Revisions / Response Due
SED Documents		On-going		
Project Specific SED Documents		8 weeks prior to RPF release date	2 weeks after receipt	2 weeks after receipt
Procurement of Commissioning Agent		Prior to the start of Pre-Design Phase		
Commissioning Design Kickoff Meeting	A,B,C	4 weeks after Design NTP		
Commissioning Kickoff Meeting Minutes	A, D	2-5 working days after the meeting	3 days after receipt	2 days after receiving comments
Commissioning Action List	A	Any status change	3 days after receipt	2 days after receiving comments
Contractor Commissioning Execution Plan	E	8 weeks after Design NTP	2 weeks after receipt	2 weeks after receipt of comments
Basis of Design and Systems Manual Outline	E	At 35%, 50% and 100% Design	2 weeks after receipt	2 weeks after receipt of comments
Commissioning Design Review Comments	E,G	At 35%, 50% and 100% Design	2 weeks after receiving design documents	2 weeks after receipt of comments
Updated Commissioning Documents	G	4 weeks after IFC	2 weeks after receiving documents	2 weeks after receiving design documents
Site Commissioning Kickoff Meeting	A,B,C	4 weeks after mechanical and electrical contractors on-site or as directed by the PD/COR		
Site Commissioning Kickoff Meeting Minutes	A,B,D	5-7 working days after the meeting	3 days after receipt	2 days after receiving comments
Commissioning Action List	A	Any status change	3 days after receipt	2 days after receiving comments

Activity / Deliverable	Required Forms from Appendix 1	Due	Review Comments Due	Revisions / Response Due
Commissioning Activity Scheduling	E	4 weeks after mechanical and electrical contractors on-site	2 weeks after receipt	2 weeks after receipt of comments
Construction Document Review	E	On-going	1 weeks after receipt	1 week after receiving comments
Equipment Submittals	E,G	Prior to procurement	1 weeks after receipt	1 week after receiving comments
Controls Integration Meeting	A,B,C	2 weeks after receiving the controls submittal		2 weeks after the meeting
Controls Integration Meeting Minutes	A,B,D	5working days after the meeting	3 days after receipt	2 days after receiving comments
Maintenance Library 1st Submittal	E,G	9 months prior to Substantial Completion	2 weeks after receipt	2 week after receiving comments
Training Plan Submittal, including Training Agenda forms	E,F,G	6 months prior to Substantial Completion	2 weeks after receipt	2 week after receiving comments
Computerized Maintenance Plan Submittal	E,G	9 months prior to Substantial Completion	2 weeks after receipt	2 week after receiving comments
Quality Control Test Procedure Submittals	E,G	6 weeks prior to the start of any procedures	2 weeks after receipt	2 week after receiving comments
Equipment Startup and Energization Schedule Submittals	E,G	6 weeks prior to the any startup or energization	2 weeks after receipt	2 week after receiving comments
Coordination Study	E,G	6 weeks prior to energization	2 weeks after receipt	1 week after receiving
Regular Commissioning Meetings	A,B,C	Monthly or more often if needed		
Regular Commissioning Meeting Minutes	A,D	2 days after the meeting	3 days after receipt	2 days after receiving comments

Activity / Deliverable	Required Forms from Appendix 1	Due	Review Comments Due	Revisions / Response Due
Cx Progress Reports	I	Monthly, moving to bi-weekly and weekly	3 days after receipt	2 days after receiving comments
Site Observation	E	Monthly, moving to weekly	3 days after receipt	2 days after receiving comments
Field Quality Control Testing & Startup Reports	E,G	Within 1 week of completion of the test or startup	2 weeks after receipt	2 days after receiving comments
Testing, Adjusting & Balancing Reports	E,G	Within 1 week of completion of the test or startup	2 weeks after receipt	2 days after receiving comments
Maintenance Library 2nd Submittal	EG	6 months prior to Substantial Completion	2 weeks after receipt	2 week after receiving comments
Functional Performance Testing Schedule	E,G	4 weeks prior to the start of any testing	3 days after receipt	2 days after receiving comments
Pre-functional Checkout	E,G	Complete 1 week prior to scheduled testing	3 days after receipt	2 days after receiving comments
Equipment Level Training	E,F,G	2 months prior to Substantial Completion		
Systems Level Training	E,F,G	2 months prior to Substantial Completion		
Functional Performance Testing	A,H,G	1 week after Pre-functional Checkout	Reports – within 3 days of testing	
Deficiency Correction	A,G	Within 2 weeks if identifying the deficiency		
Software Documentation Review	E	After functional testing, prior to substantial completion	2 weeks after receipt	1 week after receiving comments

Activity / Deliverable	Required Forms from Appendix 1	Due	Review Comments Due	Revisions / Response Due
Record Document Review	E,G	Biweekly from the start of construction through substantial completion	2 weeks after receipt	1 weeks after receiving comments
Construction Maintenance Review	E	On-going from equipment start-up through substantial completion	2 weeks after receipt	1 weeks after receiving comments
Final Maintenance Library Review	E	4 weeks prior to substantial completion	2 weeks after receipt	1 weeks after receiving comments
Training Record and Video Documentation Confirmation	E,F,G	4 weeks prior to substantial completion	2 weeks after receipt	1 weeks after receiving comments
Computerized Maintenance Plan - GMMS (WOW) Setup Demonstration /Confirmation	E,G	4 weeks prior to substantial completion	2 weeks after receipt	1 weeks after receiving comments
Final Commissioning Report		At Substantial Completion	2 weeks after receipt	1 weeks after receiving comments
Best Practice Meeting	A,B,C,D	Within 4 weeks after Substantial Completion		
Transition Facility Operation		Up to six months after substantial completion.		
Opposite Season Testing	A,H,G		Reports – within 3 days of testing	
Warranty Inspection visit and Meeting	A,B,C,D	8 to11 months after Substantial Completion		
Update Commissioning Report		4 weeks after Opposite Season Testing is complete		

4. Commissioning Activities Description

A. Pre-Design Phase

SED Documents

The OBO Commissioning Branch CxCOR and the CxA will supplement the current SED documents with site specific commissioning documentation, testing, and training requirements as follows:

a. Clearly define the system performance requirements in a formal site specific Owner's Project Requirements (OPR) Document with buy in from each OBO Office. The OPR will be jointly prepared by the CxA and OBO, then provided to the contractor. The OPR is a written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria and supporting information. The OPR will concisely indicate goals, expectations, and requirements for commissioning of facility systems.

b. Prepare a site specific Commissioning Plan, Pre-functional checklists, and functional performance test procedures.

B. Design Phase

i. Project Commissioning Kickoff Meeting

The first commissioning meeting is an introductory session to help get everyone on the same page with respect to what "commissioning" will mean for OBO and the contractor, including what their roles and responsibilities will be within the commissioning process. This meeting provides an overview so that the contractor understands the big picture and the benefits they will accrue by participating in the process.

ii. Commissioning Action List

The Commissioning Action List is a document started at the beginning of each project and utilized through the Transition Phase. The Cx Action List will consist of an Action Item Number, Date Documented, Category, Comment Author Name, Description, Responsible Team Member, Expected Completion Date, Status Update and Close Date.

The Cx Action List will be the single source of commissioning-related items with each item tracked and documented through resolution. The CxA has the responsibility for maintaining the Cx Action List throughout the entire project.

iii. Contractor Commissioning Execution Plan

The contractor shall prepare a project-specific Commissioning Execution Plan. The execution plan shall include who, what, when and where of accomplishing the activities outlined in the Commissioning Plan. The execution plan shall include a schedule for commissioning activities and deliverables. It shall include all requests for deviation from the Commissioning Plan. The document shall be prepared in a

condensed format, using tables or bulleted lists whenever possible, for use as a primary reference guide for all project commissioning team members. The Execution Plan should not be a regurgitation of the OBO Generic Commissioning Plan.

The Commissioning Execution Plan shall also include, but not be limited to, the following:

a. Names, contact information, and specific roles and responsibilities of all Commissioning Team members.
b. List of all systems to be commissioned and equipment and components that make up system.
c. Sequence of commissioning activities and the plan for coordinating them with other specified contractor responsibilities and deliverables

iv. Basis of Design

The contractor shall prepare a project Basis of Design. This is a document that records the concepts, calculations, decisions, and product selections used to meet the Owner's Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and quantitative information.

The Basis of Design document records the major thought processes and assumptions behind design decisions made to meet the Owner's Project Requirements. The Owner's Project Requirements are intended to capture "what" the owner needs and expects from a project. The Construction Documents detail "how" the Owner's Project Requirements will be physically achieved. The Basis of Design captures important information linking the "what" and "how."

The objective of specifically documenting Basis of Design information is to provide the parties involved with a project, at each phase in the process, an understanding of the underlying thinking that led to the selection of specific components, assemblies, systems, and system integrations. A design narrative that provides an overview of assemblies and systems in verbal format is usually an integral element of the Basis of Design.

The Basis of Design document will typically be developed incrementally as work on a project moves from Pre-Design, to Design, and into the Construction Phase. Changes to the Basis of Design that often occur as a design evolves must be documented. Content of the Basis of Design document will vary from project to project and system to system, but in general it should address the following:

- Specific codes, standards and guidelines considered during design of the facility and designer interpretations of such requirements.
- Information regarding ambient conditions (climatic, geologic, structural, existing construction) used during design.
- Assumptions regarding usage of the facility.
- Expectations regarding system operation and maintenance.
- Performance criteria that the system was designed to meet – linked to the Owner's Project Requirements.
- Specific design methods, techniques, software used in design.

- A narrative statement of design – that verbally describes how the designer intends to meet the Owner's Project Requirements.
- A narrative statement of operation – that verbally details how the facility is expected to operate under various situations (such as normal operation, extreme event, emergency).
- A listing of specific manufacturer makes and models used as the basis for drawings and specifications.

v. Commissioning Design Review

The CxA will review the design documents for the following commissioning-related items:

- Compliance with the design intent
- Compliance with the operational intent
- Clarity of the design
- Accessibility and maintainability
- O&M training and documentation requirements
- Ability to test and validate system operation

vi. Design Review Meetings and Comment Resolution

The CxCOR and CxA will participate in the design review comment resolution process. The CxCOR and CxA will attend applicable design review comment meetings to discuss the design review comments. Following the meeting the CxCOR and CxA will review the revised comment responses and design documents to confirm the documents reflect the agreed resolutions.

vii. Update Commissioning Documents

Although the expectation is that pre-functional checklists and functional performance test procedures will be nearly identical to the SED checklists and test procedures, some changes will be required as the designs are adapted to specific site locations. The CxCOR and CxA will modify these documents to match the project-specific design requirements.

viii. Design Phase Commissioning Meetings

Design Phase Cx Meetings will be held at regular intervals to keep communication channels open between project team members and review status of outstanding Cx Action List items. The project team will integrate and schedule commissioning activities into the design and construction process as seamlessly as possible.

ix. Systems Manual

Develop a systems manual that provides future operating staff the information needed to understand and optimally operate all commissioned systems. The Systems Manual shall be provided in addition to the O&M Manuals. The Systems Manual shall generally focus on operating, rather than maintaining, the equipment. It shall also focus on the interactions between equipment and systems. An outline shall be

provided during the Design Phase and the final Manual submitted after the completion of Cx testing.

1. Final Basis of Design
2. Operating Instructions for Building Systems Commissioned under CxA Review:
    a. Single-Line Diagrams; Flow Diagrams
    b. As-built sequences of operations, control drawings, and original set-points
    c. Operating instructions for integrated building systems
    d. Recommended schedule of maintenance requirements and frequency, if not already included in the O&M Manuals.
    e. Recommended schedule for re-testing of commissioned systems with blank test forms from the original Commissioning Plan;
    f. Recommended schedule of calibrating sensors and actuators
    g. Recommended schedule for complete re-commissioning of the project

C. Construction Phase

i. Commissioning Agent Continuity

The CxCOR will issue a separately funded task order to the present CxA to facilitate, coordinate, and oversee the construction phase commissioning activities of project.

ii. Site Commissioning Kickoff Meeting

A site kickoff meeting will be held to review the specifics of the commissioning process in the construction phase, identify representatives to the construction phase commissioning team (defined in Section 019115, *Commissioning*), and establish communication and documentation protocols for implementing the construction phase commissioning as efficiently and effectively as possible. The meeting will also serve as an avenue to discuss roles and responsibilities of each stakeholder in the Cx process, submittal processing, and conflict resolution.

iii. Commissioning Action List

During the construction phase, the CxA will maintain and update the Cx Action List.

iv. Commissioning Activity Scheduling

Commissioning Activity Scheduling is the on-going verification of the integration of all start-up and commissioning activities within the Project Execution Schedule.

Contingencies and allowances shall be addressed in the Project Execution Schedule addressing potential risks in inadequate time estimation, additional systems balancing, re-work, re-testing, pre-functional and functional testing.

The commissioning team is expected to anticipate issues prior to becoming problems, respond promptly, recommend corrective action to Project Director/COR, if required, and seek to influence all actions necessary as to avoid project delays.

While start-up and commissioning activities are being executed, any issues or problems that may be observed shall be addressed immediately.

All responsible parties shall be notified and resolutions and actions coordinated in a timely manner.

v. Equipment Submittals

Commissioning-focused submittal review comments will concentrate on the same areas as the commissioning design reviews.

- Compliance with the design intent
- Compliance with the operational intent
- Clarity of the design
- Accessibility and maintainability
- O&M training and documentation requirements
- Ability to test and validate system operation

At minimum, this equipment data includes installation and start-up procedures, O&M data, performance data and control drawings.

See Appendix 2.A for the General Submittals Procedure Flowchart.

vi. Controls Integration Meeting

Following the CxA's independent review of the control systems submittals, a meeting shall be conducted to coordinate and facilitate a controls integration process to fill "holes" in the documentation; clarify inter-system communication points and responses; and confirm that each party's roles and responsibilities are understood by the entire team. This meeting will be conducted immediately after the Site Cx Kick Off Meeting.

See Appendix 2.B for the Controls Integration Procedure Flowchart.

vii. Maintenance Library 1st Submittal

The CxA will review and validate completeness and adequacy of the Maintenance Library submittals in accordance with Section 017825, *Operations and Maintenance Data*. Note that the phrase 'Maintenance Library' is synonymous with 'Operations and Maintenance Library' throughout this document.

viii. Training Agenda Submittals

Operations & Maintenance Training Plan and Training Agendas shall be submitted by the Contractor for review at the same time as the Maintenance Library 2nd Submittal. This begins a well-thought-out, un-hurried process of planning the training to be provided to the FM operators and maintainers.

The Training Agenda contains the detailed information about each training session included in the Training Plan. Each Agenda requires specific detailed information about what the contents of the training session will be.

Each Training Agenda form (in Appendix A) shall be completed by the contractor responsible for the training session and will be reviewed by the Commissioning Agent and FM Operations & Maintenance Representative, and recommended for approval by the PD/COR.

The Training Agenda form will also be used to document who attends the training session and formal FM Operations & Maintenance Representative acceptance of the training.

Training requirements for systems and equipment to be commissioned are listed in Specification Section 019115, *Commissioning*.

See Appendix 2.C for the Operations & Maintenance Training Procedure Flowchart.

ix. Computerized Maintenance Plan Submittal

The CxA will review and validate completeness and adequacy of the Computerized Maintenance Plan submittal in accordance with Section 017825, *Operations and Maintenance Data*.

x. Quality Control Test Procedure Submittals

The CxA will review and validate completeness and adequacy of the Quality Control Test Procedure submittals in accordance with individual specification sections. Refer to specification Section 019115, *Commissioning*, for a list of required Quality Control Test Procedures.

See Appendix 2.D for the Quality Control Documentation Procedure Flowchart.

xi. Equipment Startup and Energization Schedule Submittals

The CxA will review and validate completeness and adequacy of the equipment startup and energization schedule prepared by the contractor.

See Appendix 2.D for the Quality Control Documentation Procedure Flowchart.

xii. Coordination Study

The OBO Commissioning Branch confirms that the study reports include adequate detail and that the resulting documentation provides an adequate reference for operations and maintenance. The OBO Commissioning Branch also confirms that the study includes a comparison between short circuit analysis results and equipment ratings, which ensures that the supplied distribution equipment meets specification requirements. Documentation in the reports include one-line diagrams, explanation of assumptions, utility provided data, computer analysis program data, manufacturer's time current curves, original equipment manufacturer cut sheets, a listing of all final settings, and an explanation for the final settings of each function.

xiii. Regular Commissioning Meetings

The follow-on meetings will be used to coordinate the details of current and upcoming commissioning activities, the project schedule, and review outstanding Cx Action List items.

xiv. Commissioning Progress Reports

The CxA will prepare a monthly commissioning status report for concurrent submission to the Project Director and OBO. The Monthly status report shall include the state and progress of commissioning, upcoming activities and outstanding issues.

At the beginning of construction, the CxA provides the OBO/PD with monthly commissioning progress reports. See Appendix 1 form. Thirty (30) days prior to the startup of the first piece of major equipment, the frequency of progress reports is increased to twice per month, until startup is completed. Thirty (30) days before functional testing of equipment begins, weekly progress reports are required until functional testing and all non-conformance issues are resolved. The OBO/PD may

adjust the reporting frequency as needed. The progress reports contain: an update of the schedule with list of requested schedule changes and new items added to the schedule, a list of new and outstanding deficiencies, a description of commissioning progress corresponding to the plan, etc.

The CxA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling issues through meetings, progress reports, etc.

The CxA will keep all commissioning documentation in an organized notebook, available for all Commissioning Team Members to review. In addition all documentation shall be placed in the appropriate project commissioning Exchange folder in ProjNet.

xv. Site Observation

The Project Director/COR will keep the CxA appraised of any design and schedule related issues that will impact the commissioning process. The CxA will keep records of changes to the design and actual installation conditions.

Commissioning Agent shall review Quality Control documentation and observe the course of construction as necessary to verify that project execution actions facilitate the successful conclusion of start-up and commissioning activities. If, in the determination of the Commissioning Agent, certain actions have the potential to effect an adverse project completion outcome, the CxA shall identify and report it to the Project Director/COR and CxCOR.

The Commissioning Agent shall observe:

- balancing of air and water systems, ensure compliance with the design intent, and verify accuracy of all results.
- flushing and pressure testing of all piping systems.
- and verify safe and reasonable accessibility to all commissioned equipment and systems requiring regular maintenance.
- photograph or video capture, and document the actual performance of safety shutoffs in real or closely simulated failure condition. The majority of mechanical equipment requires safety devices to stop or prevent equipment operation absent minimum safety standards.
- sufficient field testing to confirm that all I/O points have been properly tested in accordance with accepted commissioning procedures. The temperature control system shall have all I/O points individually verified for proper function, calibration and operation.

xvi. Construction Document Review

The CxA shall review the project Construction Documents, Change Orders, Requests for Information and any other correspondence to become familiar with the technical details of the systems to be commissioned and to advise the Project Director/COR and CxCOR of any deviations from the design intent.

D. Acceptance and Turnover Phase

i. Field Quality Control Testing & Startup Reports

The CxA will review and validate completeness and adequacy of the Field Quality Control Testing & Startup Procedures and Reports in accordance with individual specification sections. Refer to specification Section 019115, *Commissioning*, for a list of required Quality Control Test & Startup Procedures and Reports.

See Appendix 2.D for the Quality Control Documentation Procedure Flowchart.

ii. Testing, Adjusting & Balancing Reports

The CxA will review and validate completeness and adequacy of the Testing, Adjusting & Balancing Reports in accordance with specification Section 230593, *Testing, Adjusting, and Balancing*.

iii. Maintenance Library 2nd Submittal

The CxA will review and validate completeness and adequacy of the Maintenance Library submittals required for the 2nd submission and back check comments of the Maintenance Library submittals in accordance with Section 017825, *Operations and Maintenance Data.*

iv. Functional Performance Testing Schedule

The Functional Performance Testing Schedule is a detailed sub-set of the master schedule that provides very detailed Functional Performance Testing Scheduling information. The intent of the Functional Performance Testing Schedule is to provide a means to efficiently communicate schedule changes that directly impact the functional testing. Inevitably, schedule changes early in the project affect activities near the end of the project thus the Functional Performance Testing Schedule must be efficiently updated and issued to the project team on a regular basis.

See Appendix 2.E for the Functional Performance Testing Procedure Flowchart.

v. Pre-functional Checkout

Pre-functional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., oil levels, fan belt tension, labels affixed, gauges in place, sensor calibration, etc.). However, some Pre-functional checklist items entail simple testing of the function of a component, a piece of equipment or system (such as measuring the voltage imbalance on a three phase pump motor of a chiller system).

The word pre-functional refers to “before” functional testing. Pre-functional checklists augment and are combined with the manufacturer’s start-up checklists for each component of each commissioned system.

Each piece of equipment receives full pre-functional checkout by the Contractor. No sampling strategies are used.

Pre-functional checklists are used to document that the equipment and systems are hooked up and operational and that functional performance testing may proceed without unnecessary delays. The pre-functional testing for a given system must be

successfully completed prior to formal functional performance testing of equipment or subsystems of the given system.

The commissioning process requires that the start-up procedures and pre-functional checklists be documented in writing by the responsible Contractor or Subcontractor personnel.

The Commissioning Agent shall review and spot check the pre-functional checkout and witness start-up work activities based on the following sampling strategy:

Equipment or System	Fraction To Be Observed by CxA
Central plant (chillers, boilers, cooling tower)	50%
Air Handling Units	50%
Pumps, VFD's	10%
Terminal units	2%
Building automation system	90%
TAB work	25%
Other misc. equipment	As necessary
Chem-Bio Filtration	100%

The Commissioning Agent shall document findings.

See Appendix 2.E for the Functional Performance Testing Procedure Flowchart.

vi. Equipment and System Level Training

The CxA will review and validate completeness and adequacy of contractor provided training in accordance with Section 017905, *Demonstration and Training*, by attending select training sessions and collecting documentation of FM Staff acceptance of all training sessions for equipment and systems to be commissioned.

See Appendix 2.C for the Operations & Maintenance Training Procedure Flowchart.

vii. Functional Performance Testing

Functional performance testing will be executed by the appropriate Contractor or vendor, witnessed and documented by the Commissioning Agent.

Functional Performance Test Plans will be prepared by the CxA and provided to the contractor for use at the project site.

Functional testing shall include a full and complete demonstration of all facility component and building systems controls including all control devices, wiring, operational sequences of operation and alarm generation. It shall be demonstrated that these meet the performance standards identified in the various specification sections

All performance testing will be witnessed by the CxA with all test results and outcomes independently recorded. To ensure consistency of approach to each type of information being recorded, documentation shall be recorded on standard forms.

For any given system, prior to performing functional testing, the CxA waits until the Pre-functional checklist has been submitted with the necessary signatures, confirming that the system is ready for functional testing.

The Commissioning Agent will evaluate the results of all commissioning procedures for compliance with design intent and shall advise the Project Director/COR and CxCOR should it be determined that the results attained or adjustment procedures used are unsatisfactory. The CxA will recommend to the Project Director/COR and CxCOR corrective action(s) necessary.

Correction of Deficiencies: The Commissioning Agent will provide unique technical expertise to observe and verify the correction of all deficiencies found during the commissioning process.

Acceptance: The Commissioning Agent will determine whether each facility component and building system has met performance standards and specifications per the contract documents.

The Commissioning Agent will make recommendations for acceptance of each individual facility component and building system to the Project Director/COR and CxCOR.

When a system is ready for USG acceptance, the Commissioning Agent shall document in writing to the USG that the system is complete, meets the design intent, functions as intended, is correctly documented, and operator training has been performed.

a. Deficiency Documentation, Correction & Tracking

The contractor shall correct minor deficiencies identified by the CxA during the tests that do not impede the functional testing procedures. The CxA records the results of the tests on the procedure or test form. Deficiencies or non-conformance issues are noted and reported to the OBO/PD and in the Cx Action List. The Contractor corrects deficiencies and notifies the CxA. The Contractor schedules retesting after the corrections have been made and within 2 weeks of the initial identification of the deficiency.

See Appendix 2.E for the Functional Performance Testing Procedure Flowchart.

viii. Software Documentation Review

The CxA will review detailed software documentation prepared by the Contractor for all Direct Digital Control (DDC) systems.

The review shall include vendor documentation, the programming approach and the specific software routines applied to project facility components and building systems.

Any issues developed or discrepancies determined to exist in programming approaches or in sequences shall be reported in writing to the Project Director/COR and the CxCOR.

ix. Record Document Review

The CxA will review as-built record drawings to verify incorporation of both design changes and as-built construction details. The CxA will review overall documentation (e.g. specifications, product data, design data, shop drawings, etc.) for all commissioned equipment and systems to insure completeness of documentation. Discrepancies shall be identified in writing to the Project Director /COR and CxCOR.

x. Construction Maintenance Review

The CxA will review documentation of all preventive maintenance and corrective maintenance performed on commissioned systems by the Contractors prior to substantial completion.

xi. Final Maintenance Library Review

The CxA will review and back check comments of the 1st and 2nd submittals in accordance with Section 017825, *Operations and Maintenance Data*.

xii. Training Record and Video Documentation Confirmation

The CxA will review and validate completeness and adequacy of training and video documentation in accordance with Section 017905, Demonstration and Training.

See Appendix 2.C for the Operations & Maintenance Training Procedure Flowchart.

xiii. Computerized Maintenance Plan – GMMS (WOW) Setup Demonstration /Confirmation

The CxA will review of the Contractors submissions for Global Maintenance Management System (GMMS)/ Work Order for Windows (WOW) to confirm compliance with specification requirements and the needs of FM staff.

xiv. Final Commissioning Report

The Commissioning Report shall provide documentation of all start-up and commissioning activities including performance checklists, performance data sheets, and results of all functional performance testing. The Commissioning Report shall include documentation of acceptance of facility components and building systems. The Commissioning Report shall include all required Commissioning Agent submittal documentation. At a minimum the report shall contain the information as listed in the report outline and sample report format below.

The CxA will compile, organize and index the following commissioning data by system into labeled, indexed and tabbed, three-ring binders and deliver it and four (4) DVD or CD copies to the PD/COR, so data can be included with the Maintenance Library submittal package provided by the Contractor.

The correspondence, meeting minutes and progress reports, miscellaneous notes, etc. kept in the Commissioning record notebook during construction shall not be included in the Maintenance Library. However, this documentation shall be included in the Final Commissioning Report.

The format of the Report follows in this sample:

Sample Commissioning Report Format

I-1 thru I-5 and 01 - 19 are major tabs (colored).
Sections A-C under major tabs are sub-tabs (clear).
Major tabs may fill an entire binder as necessary.

I-1	COMMISSIONING PLAN
I-2	COMMISSIONING SUMMARY
I-3	COMMISSIONING ACTION LIST
I-4	COMMISSIONING RECORD All CxA Deliverables
I-5	PROGRESS RECORDS
01	CHILLER SYSTEM
02	HW SYSTEM
03	AIR HANDLERS
04	PACKAGED AC UNITS
05	TERMINAL UNITS
5a	Floor 1
5b	Floor 2
	Or Zone 1, Zone 2 ….etc

Three Clear Tabs Under Each Major System
(With contents listed on cover sheet)

A- DESIGN
*Design narrative
*Design criteria
*Sequence of operation
*Approvals of design and equipment

B- PREFUNCTIONALS
--colored separator sheet for each type of equipment, (pumps, chillers, fans, etc.)
*Startup plan, report & checklists
*Approvals & corrections of above
*Blank prefunctional checklists

C- FUNCTIONAL TESTS
*Filled out test report records
*Trending & analysis
*Approvals & corrections of test records
*Training Agendas
*Blank test forms
*Recommended recommissioning schedule

Note: The major tabs listed below are typical but actual titles will be project specific and match those as required by Section 019115, *Start-up and Commissioning*.

Major Tabs Continued:

06 Computer room AC units
07 Unit heaters or AC spot coolers
08 Heat exchangers
09 Service water system
10 Test and balance (TAB)
11 Building automation system (controls)
12 Specialty fans
13 Fume hoods

14 Split AC / HP
15 Lighting controls
16 Emergency power
17 UPS
18 Fire alarm / protection
19 Misc.

E. Transition Phase

i. Best Practice Meeting

Following the acceptance and turnover phase, a commissioning team meeting will be held to discuss the efficiency of the commissioning procedures and process implemented on the project. Since each project presents unique challenges this meeting is intended to facilitate discussions regarding the solutions to the issues and overall efficiencies of the commissioning process. The goal of the meeting is to document a list of Best Practices that can be applied to future projects.

ii. Transition Facility Operation

The CxA will remain on-call (but not on-site) after substantial completion to support the facility O&M staff as they assume responsibility for operating and maintaining the facility. The duration for this activity will be dependent on the project site and the experience level of the O&M Staff.

The Commissioning Agent shall have an allowance of time to support the FM O&M staff as they assume responsibility for the commissioned systems. This support will be delivered from an off-site location.

iii. Opposite Season Testing

Perform Functional Testing of heating, ventilating and air conditioning systems if required to demonstrate performance in a season different from the season during which initial functional performance testing was conducted.

Any final adjustments to the Maintenance Library and record drawings due to the testing are made by the Contractor.

iv. Warranty Inspection Visit and Meeting

One to four months prior to warranty expiration, the CxA will return to the site to meet with the O&M staff and the Contractor's Warranty Manager. This meeting is an opportunity for the O&M staff to provide feedback on the effectiveness and efficiency of the new systems. The CxA will review with facility staff the current building operation and the conditions of outstanding issues related to the original and seasonal commissioning. During the meeting the Contractor's Warranty Management Reports will be reviewed and the group will identify additional areas that may come under warranty or under the original construction contract. Information gathered will be used to track and correct warranty-related issues prior to expiration and/or to contribute to future SED documents. See Specification Section 01771 *Closeout Procedures* for more information on the Contractor's requirements for Warranty Management.

v. Update Commissioning Report

The Commissioning Agent shall amend the Commissioning Report based on activities in the Transition Phase

5. Commissioned Systems

Systems and equipment to be commissioned shall be those listed in Specification Section 019115, *Commissioning*.

6. Project Specific Information

A. Location

About the city and country.

B. Site Information

About the site location and utilities.

C. Facility Information

About the specific facilities to be included on the site including square footage and height.

D. Project Schedule

Design and Construction Schedules

E. Challenges

Include any potential challenges to the OBO Generic Commissioning Process.

Appendix 1 – Forms

The forms in this appendix are provided for use during the commissioning process. Refer to the Section 3.C *Commissioning Activity Schedule Matrix* for when each form will be used.

A. Commissioning Action List

B. Commissioning Sign-In Sheet

C. Commissioning Meeting Agenda

D. Commissioning Meeting Minutes

E. Commissioning Review Comments

F. Operations & Maintenance Training Agenda

G. Commissioning Tracking Document

i. Systems

ii. Equipment

H. Field Test Report

I. Commissioning Progress Report

Appendix 2 – Procedure Flow Charts

A. General Submittals Procedure

B. Controls Integration Procedure

C. Operations & Maintenance Training Procedure

D. Quality Control Documentation Procedure

E. Functional Performance Testing Procedure

OVERSEAS BUILDING OPERATIONS - PROJECT NAME

COMMISSIONING ACTION LIST

ACTION ITEM #	DATE LOGGED	TECHNICAL CATEGORY	COMMENT GENERATOR	RESPONSIBLE TEAM MEMBER(S)	ITEM DESCRIPTION	CONTRACT REQUIREMENT REFERENCE (if applicable)	STATUS	EXPECTED COMPLETION DATE	STATUS UPDATE	CLOSE DATE
1		Cx Documentation	CxA	Contractor's A/E	Submit Basis of Design	Cx Specification	Open		[Date] Status Update [Date] Status Update	
2										
3										
4										
5										
6										
7										
8										
9										
10										

Technical Category
General
Design
Cx Documentation
HVAC
Electrical
Life Safety

Responsible Party
CxA
OBO
PD/COR
Contractor
Contractor's A/E
Electrical Contractor
Mechanical Contractor
Controls Contractor
Fire Alarm Contractor
Facility Manager
Security Contractor
TAB Contractor

Deficiency or Open Item
Deferred
On going
Open
Closed

Comment Generator
CxA
OBO
PD/COR
Contractor
Contractor's A/E
Electrical Contractor
Mechanical Contractor
Controls Contractor
Fire Alarm Contractor
Facility Manager
Security Contractor
TAB Contractor

OVERSEAS BUILDING OPERATIONS
PROJECT NAME
COMMISSIONING MEETING
Date
Location

Sign-in Sheet

Please Print

NAME	COMPANY	OFFICE PHONE	CELL PHONE	E-MAIL

OVERSEAS BUILDING OPERATIONS
PROJECT NAME

COMMISSIONING MEETING
Date
Time
Location

AGENDA

TIME	TOPIC	FACILITATOR

OVERSEAS BUILDIGN OPERATIONS
PROJECT NAME

COMMISSIONING MEETING MINUTES

Meeting Date:

Meeting Location:

Attendees:

Name	Affiliation	Email

Distribute To: Attendees

Notes By:

Attachments:

Item #	Discussion	Action Required By
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

End of Minutes

COMMISSIONING REVIEW COMMENTS

Comment Number	OVERSEAS BUILDING OPERATIONS C = Critical CO = Coordinate S = Suggestion Q = Question	Initial Comment Date	Comment Generator	Project Name Reference Type	Number	Date	Contract Requirement Reference (if applicable)	REVIEW DESCRIPTION & DATE Review Comment	Design Team / Contractor / Responsible Party Response
EXAMPLE 1	C	21-Dec-06	Name	Spec	15950	5-Jan-07		This is the reviewer's comment box.	This is where the design team can record their response to the comment

Submit by Email

OVERSEAS BUILDING OPERATIONS
FACILITY COMMISSIONING

PROJECT NAME

OPERATIONS & MAINTENANCE TRAINING AGENDA

EQUIPMENT / SYSTEM

SPECIFICATION SECTION

INSTRUCTIONS		DUE DATE
Sections 1,2,3:	The responsible contractors have their trainers fill out Sections 1, 2 & 3 and submit to Facility Management and Commissioning Agent for review and acceptance prior to conducting training.	Submit 9 months prior to Substantial Completion.
Section 4:	Facility Management and Commissioning Agent complete Section 4.	Review and comment or sign within 2 weeks after receipt.
Section 5:	Completed by the Trainees following the session.	Within 1 week of training session.
Section 6:	PD/COR Acceptance	

SECTION 1. General Scope

General Objectives and scope of training. (Check all that apply)

☐ A. Provide an overview of the purpose and operation of this equipment, including required interactions of trainees with the equipment.
☐ B. Provide technical information regarding the purpose, operation and maintenance of this equipment at an intermediate level, expecting that serious malfunctions will be addressed by factory representatives.
☐ C. Provide technical information regarding the purpose, operation, troubleshooting and maintenance of this equipment at a very detailed level, expecting that almost all operation, service and repair will be provided by the trainees.
☐ D. Video Recording

SECTION 2. Instructors

ID	COMPANY	TRAINER	POSITION/QUAILIFICATIONS
1			
2			
3			

SECTION 3. Agenda

3.A Location

☐ Classroom	Date		Enter Location	
☐ Project site	Date			
☐ Factory	Date			

3.B Agenda of general subjects covered (Check all that apply)	Duration (Hours)	Instructor ID	
☐ General purpose of this system or equipment (design intent)			☐ Complete
☐ Review of control drawings and schematics (have copies for attendees)			☐ Complete
☐ Startup, loading, normal operation, unloading, shutdown, unoccupied operation, seasonal changeover, etc., as applicable			☐ Complete
☐ Integral controls (packaged): programming, troubleshooting, alarms, manual operation			☐ Complete
☐ Building automation controls (BAS): programming, troubleshooting, alarms, manual operation, interface with integral controls			☐ Complete
☐ Interactions with other systems, operation during power outage and fire			☐ Complete
☐ Relevant health and safety issues and concerns and special safety features			☐ Complete
☐ Energy conserving operation and strategies			☐ Complete
☐ Any special issues to maintain warranty			☐ Complete
☐ Common troubleshooting issues and methods, control system warnings and error messages, including using the control system for diagnostics			☐ Complete
☐ Special requirements of tenants for this equipment's function			☐ Complete
☐ Service, maintenance and preventative maintenance (sources, spare parts inventory, special tools, etc.)			☐ Complete
☐ Question and answer period			☐ Complete
Other Areas Covered:			
			☐ Complete
			☐ Complete

3.C Training Methods	Clarification
☐ Use of the O&M manuals, illustrating where the verbal training information is found in writing	
☐ The control drawing schematic and sequence of operations	
☐ A copy of this agenda.	
☐ Discussion/lecture at site	
☐ Site demonstration of equipment operation	
☐ Written handouts	
☐ Manufacturer training manuals	
☐ Classroom lecture	
☐ Classroom hands-on equipment	
☐ Video presentation	
☐ Question and answer period	

SECTION 4. Training Agenda Acceptance

This *plan* has been accepted by the following individuals, subject to the additions and clarifications noted. *(This is not an Acceptance of training completion.)*

	Representative Signature	Date
Facility Manager		
Commissioning Agent		

Notes

SECTION 5. Documentation of Training Session

Date

Start Time

End Time

Location

Attendee Name	Organization / Department	Comments

SECTION 6. PD/COR Acceptance of Training Session

This *training session* has been accepted by the following individuals, subject to the additions and clarifications noted.

	Signature	Date
PD/COR		

Notes

OVERSEAS BUILDING OPERATIONS **EQUIPMENT TRACKING**

PROJECT NAME

Equipment Tag	Equiptment Description	Building	System	Spec Section	Equipmnet Submittal					QC Test Procedures					QC Test Reports					Startup Report					O&M Manauls					Training Agenda (Blank)					Training Agenda (Completed)					Video Documentation					Redlines & As-builts				
					Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Notes
Pumps																																																
	Heating Primary		Heating Hot Water																																													
	Heating Secondary		Heating Hot Water																																												
	Chilled Water Primary		Chilled Water																																											
	Chilled Water Secondary		Chilled Water																																											
	Condensor		Chilled Water																																											
Chillers																																														
	Chiller		Chilled Water																																											
	Chiller		Chilled Water																																											
Cooling Tower																																														
	Cooling Tower		Chilled Water System																																											
	Cooling Tower		Chilled Water System																																										
Boiler System																																														
	Boiler																																													
	Boiler																																													

OVERSEAS BUILDING OPERATIONS **EQUIPMENT TRACKING**
PROJECT NAME

		TAB Report / Coordination Study				Systems Training Agenda				Maintenance Librbary				Prefuncational Checklist				Funcational Peformance Test											
Building	System	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Initially Tested	Date Report Submmited	Difficency tracking nmumbers	Retest #1	Date Report Submmited	Difficency tracking nmumbers	Retest #2	Date Report Submmited	Difficency tracking nmumbers	Date Accepted
New Office Building (NOB)																											
NOB	Chilled Water System (chillers, cooling towers, heat exchangers, pumps, VFDs, air separator, expansion tank, controls)																										
NOB	Heating Hot Water Systems (boilers, pumps, VFDs, air separator, expansion tank controls)																										
NOB	Boiler Fuel Oil System																										
NOB	Makeup Air Systems (fans, coils, filters, VFDs, humidifier, controls)																										
NOB	Air Handling Systems (fans, coils, filters, VFDs, controls, chem-bio)																										
NOB	Exhaust Fans (toilet, relief)																										
NOB	Smoke Exhaust System																										
NOB	Kitchen Ventilation Systems (kitchen exhaust fans, kitchen makeup air fans)																										
NOB	Space and Building Pressurization Systems																										
NOB	Terminal Units (VAV, unit heaters, fan coils, radiation, etc.)																										
NOB	Domestic Hot Water Systems																										
NOB	Kitchen Hot Water (water heaters, controls)																										
NOB	Non-Kitchen Hot Water (tankless point of use water heaters)																										
NOB	Domestic Water Systems (pump, automatic trap priming system, controls)																										
NOB	Potable Water System (storage tank, water treatment)																										
NOB	Sanitary Service Ejector System (pump, controls)																										
NOB	Storm Water System (pump, controls)																										
NOB	Switchgear (Double Ended)																										
NOB	Switchgear																										
NOB	LVDO Circuit Breakers																										
NOB	Ground Fault Protection																										
NOB	Automatic Transfer Operation																										
NOB	Metering																										
NOB	Uninterruptible Power Supply																										
NOB	Switchboards (including circuit breakers >400A)																										
NOB	Panelboards																										
NOB	Motor Control Centers																										
NOB	Grounding and Lightning Protection																										
NOB	Lighting/Lighting Controls (dimming, sweep etc.)																										
NOB	Communications Systems																										
NOB	Building Security																										
NOB	Fire Alarm System																										
NOB	Fire Protection System																										
NOB	Elevators (including elevator pit pumps)																										
NOB	Refrigeration Equipment																										
NOB	Food Service Equipment																										
NOB	Generator set and associated remote control transfer switch																										
NOB	Building Automation System (BAS)																										
NOB	Building pressurization																										
Marine Security Guard Quarters (MSGQ)																											
MSGQ	Air Handling Systems (fans, coils, filters, VFDs, air cooled condenser, controls)																										
MSGQ	Exhaust Fans (toilet)																										
MSGQ	Space and Building Pressurization Systems																										
MSGQ	Terminal Units (VAV, unit heaters, fan coils, radiation, etc.)																										
MSGQ	Domestic Hot Water system (water heaters, pumps, expansion tank, controls)																										
MSGQ	Grounding and Lightning Protection																										
MSGQ	Lighting/Lighting Controls (dimming, sweep etc.)																										
MSGQ	Communications Systems																										
MSGQ	Building Security																										
MSGQ	Fire Alarm System																										

OVERSEAS BUILDING OPERATIONS
PROJECT NAME

EQUIPMENT TRACKING

		TAB Report / Coordination Study				Systems Training Agenda				Maintenance Librbary				Prefuncational Checklist				Funcational Peformance Test											
Building	System	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Initially Tested	Date Report Submmited	Difficency tracking nmumbers	Retest #1	Date Report Submmited	Difficency tracking nmumbers	Retest #2	Date Report Submmited	Difficency tracking nmumbers	Date Accepted
MSGQ	Fire Protection System (sprinklers)																										
MSGQ	Panel board																										
MSGQ	Switchboard																										
Utility Building																											
Utility	Exhaust Fans (general exhaust, controls)																										
Utility	Water Filtration System (pumps, tanks, filters, absorbers, water softeners, disinfection system, controls)																										
Utility	Domestic Water Booster System (pumps, tanks, controls)																										
Utility	Fuel Oil System (tanks, pumps, controls)																										
Utility	Sump Pump																										
Utility	Medium Voltage Switchgear																										
Utility	Automatic Voltage Regulator																										
Utility	MV Transformer																										
Utility	Main Compound Distribution Switchgear																										
Utility	Switchgear (Double Ended)																										
Utility	LVDO Circuit Breakers (>400A)																										
Utility	Ground Fault Protection																										
Utility	Automatic Transfer Operation																										
Utility	Relay(s) (u/o voltage, phase loss etc.)																										
Utility	Metering																										
Utility	Generator System																										
Utility	Generator																										
Utility	Paralleling Switchgear																										
Utility	Circuit Breakers																										
Utility	Relay(s)																										
Utility	Metering																										
Utility	Fuel System																										
Utility	Automatic Transfer Switch																										
Utility	Switchboards (including circuit breakers >400A)																										
Utility	Panelboards																										
Utility	Power Factor Correction Capacitor Bank																										
Utility	Grounding and Lightning Protection																										
Utility	Power Quality																										
Utility	Communications Systems																										
Utility	Building Security																										
Utility	Fire Alarm System																										
Utility	Fire Protection System (sprinklers, fire pump, controls)																										
Utility	Load bank																										
Control Access Control Facilities (CAC)																											
CAC	Air Handling System (fans, coils, filters, controls)																										
CAC	Exhaust Fans (toilet, general)																										
CAC	Space and Building Pressurization Systems																										
CAC	Domestic Water Systems (pump, expansion tank, controls)																										
CAC	fuel Storage System (tanks, pumps, controls																										
CAC	Grounding and Lightning Protection																										
CAC	Lighting/Lighting Controls																										
CAC	Communications Systems																										
CAC	Building Security																										
CAC	Site Security																										
CAC	Fire Alarm System																										
CAC	Fire Protection System																										
CAC	Panel board																										

OVERSEAS BUILDING OPERATIONS **EQUIPMENT TRACKING**
PROJECT NAME

		TAB Report / Coordination Study				Systems Training Agenda				Maintenance Librbary				Prefuncational Checklist				Funcational Peformance Test											
Building	System	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Received	Date Comments Submitted	Date Response Received	Date Accepted	Date Initially Tested	Date Report Submmited	Difficency tracking nmumbers	Retest #1	Date Report Submmited	Difficency tracking nmumbers	Retest #2	Date Report Submmited	Difficency tracking nmumbers	Date Accepted
CAC	UPS																										
Recreation Building (REC)																											
REC	TBD																										
Warehouse (WHE)																											
WHF	TBD																										
Support Annex / New Office Annex (NOX)																											
GSO	TBD																										
Staff Diplomatic Apartments (SDA)																											
SDA	TBD																										
Government Systems																											
Gov	Antennae																										
Gov	FEBR Doors and Windows																										
Gov	Phones																										
Gov	TSS Bill of Materials																										
Gov	Lock Cores																										
Gov	Radio Rooms/Radios																										
Gov	Computers																										

OVERSEAS BUILDING OPERATIONS - PROJECT NAME
FIELD TEST REPORT

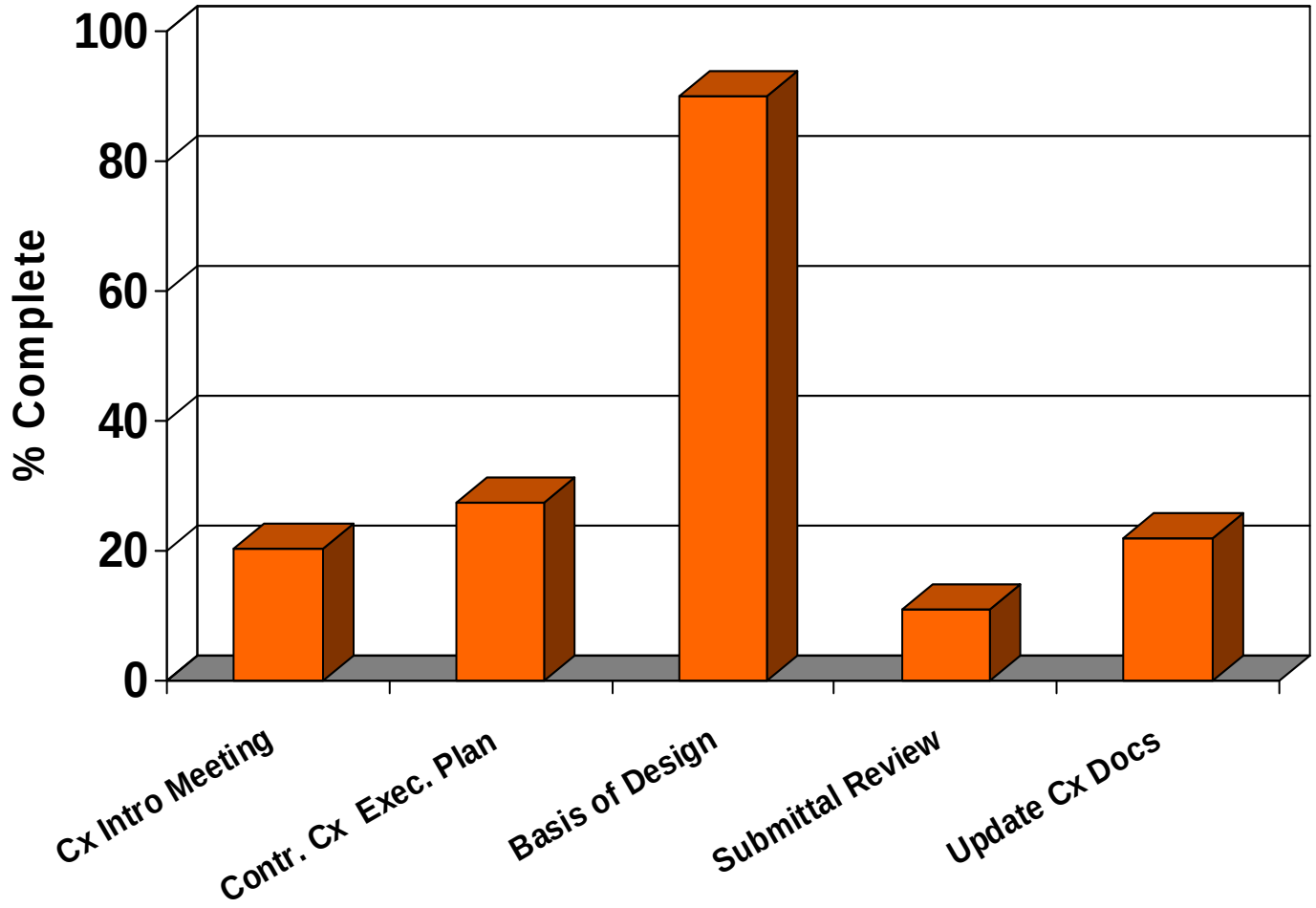
Date	Test Procedure	Duration	Participants	Comments	Type	Findings	Contract Requirement Reference (if applicable)	Action List Reference
						Description		
Date	System	1.5	Paul (XYZ) Mary (ABC)	Comments about executing the test procedure	Initial Test	Technical details about findings		xx

Overseas Building Operations
Project Name
Commissioning Progress Report

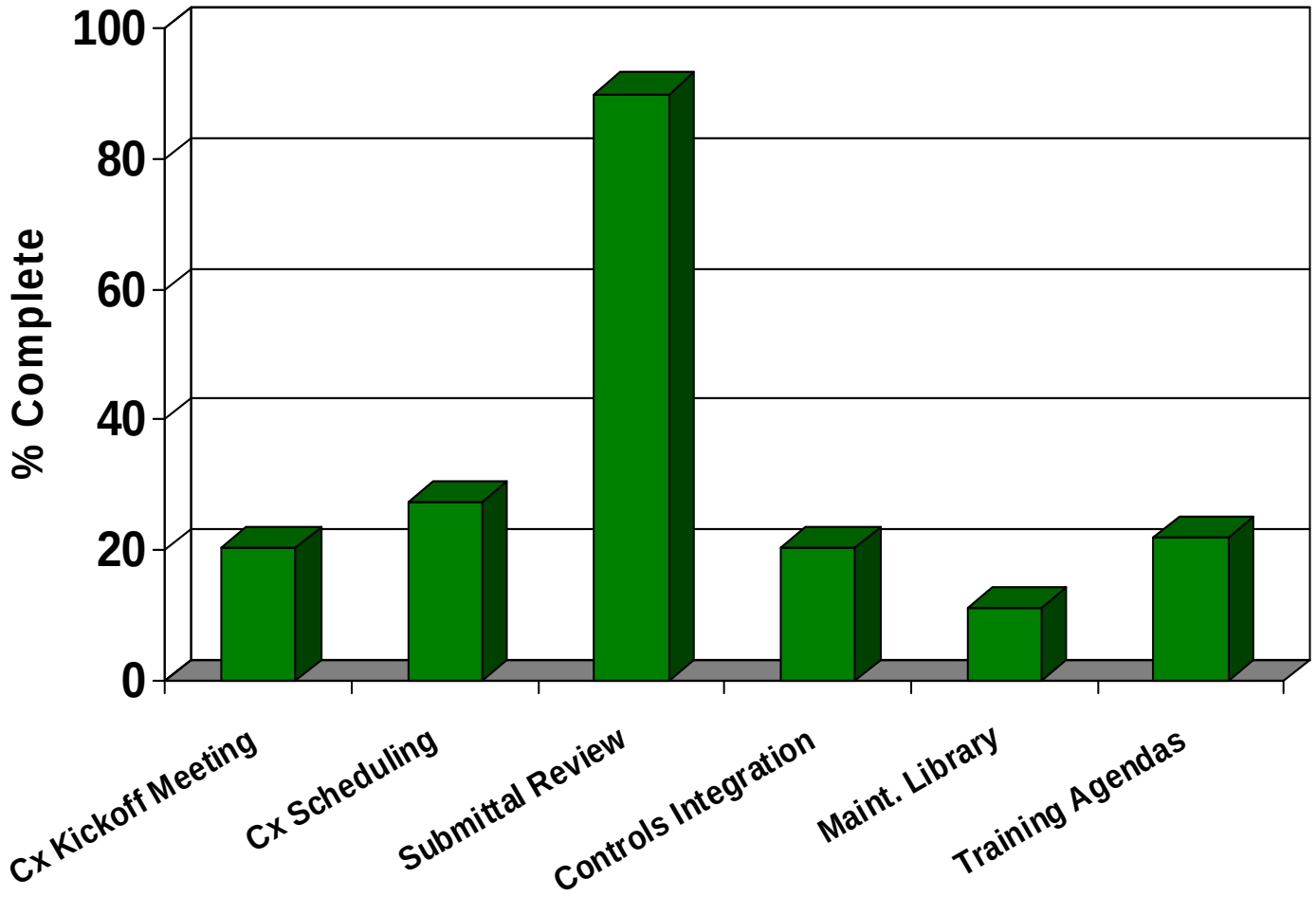
Period: 00/00/00 – 00/00/00

Prepared by:

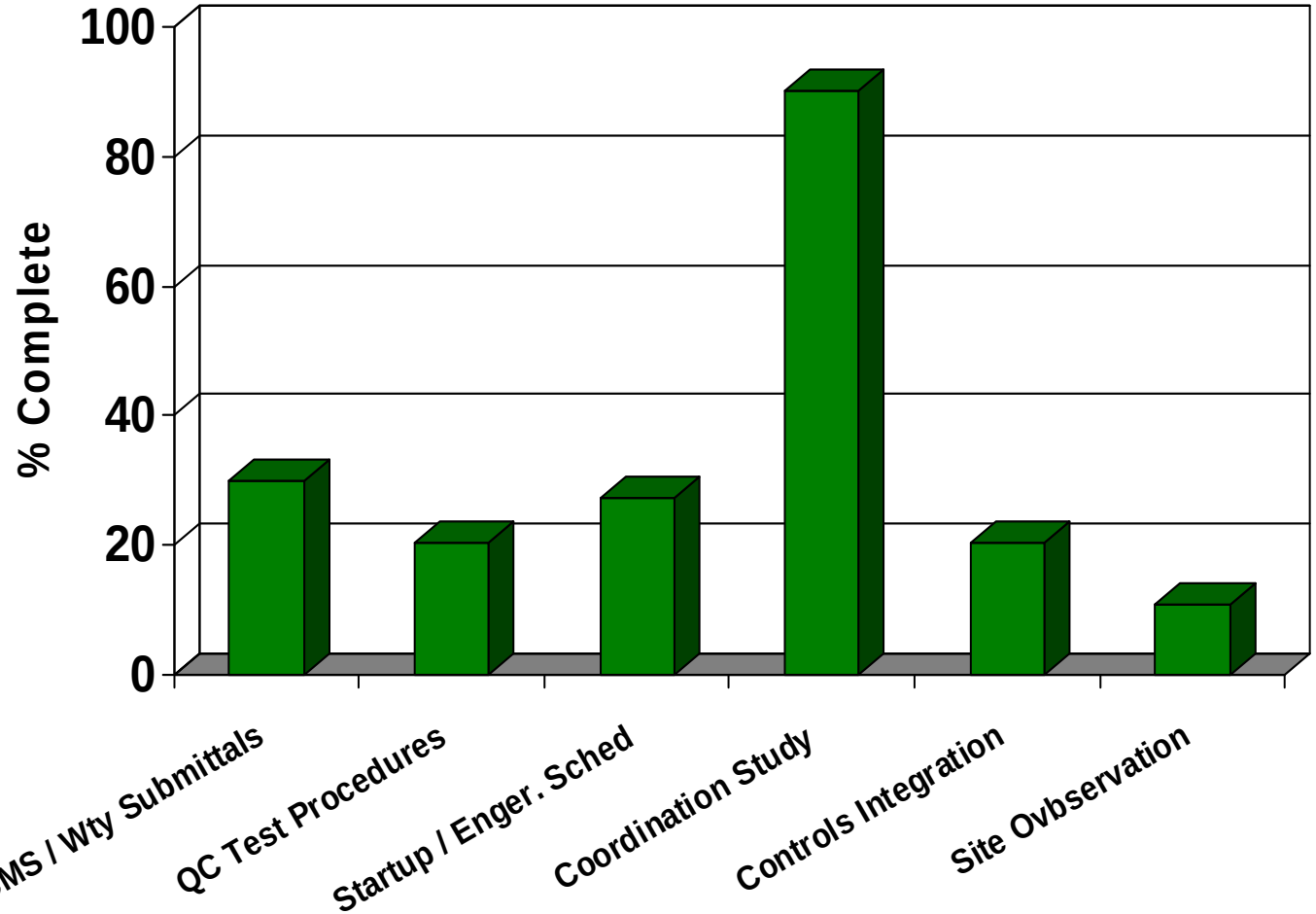
Commissioning Progress
Design Phase



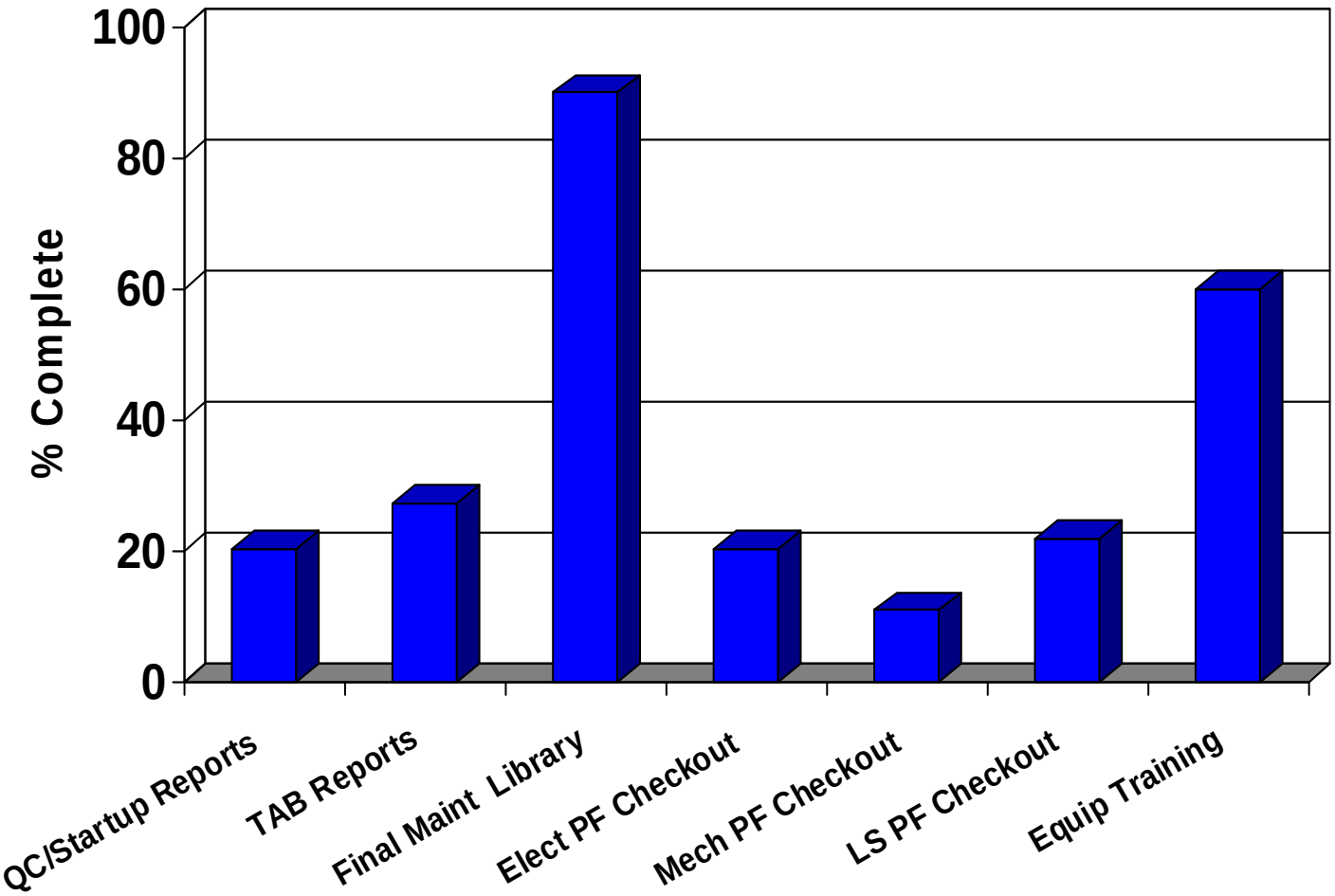
Commissioning Progress
Construction Phase



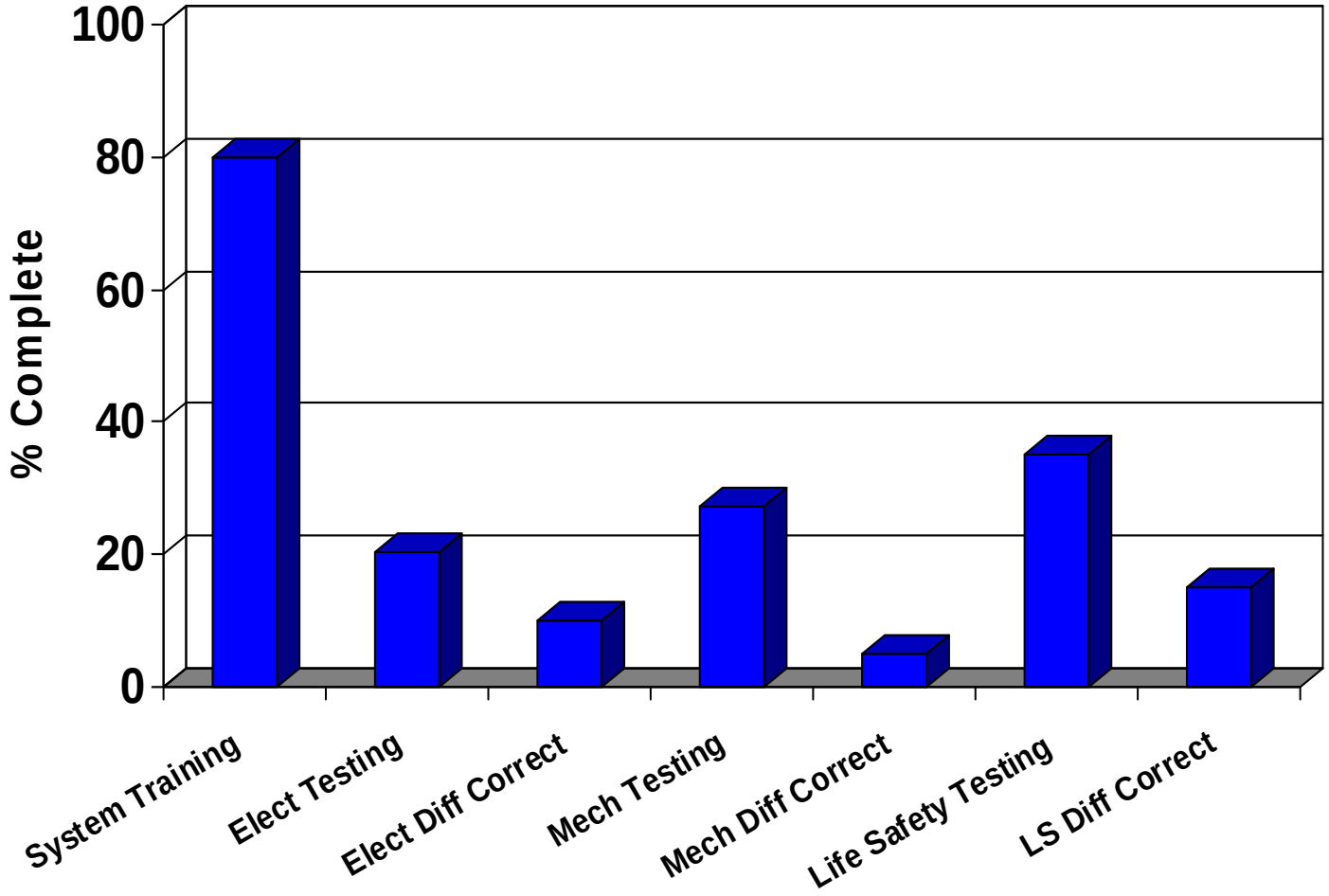
Commissioning Progress
Construction Phase Cont.



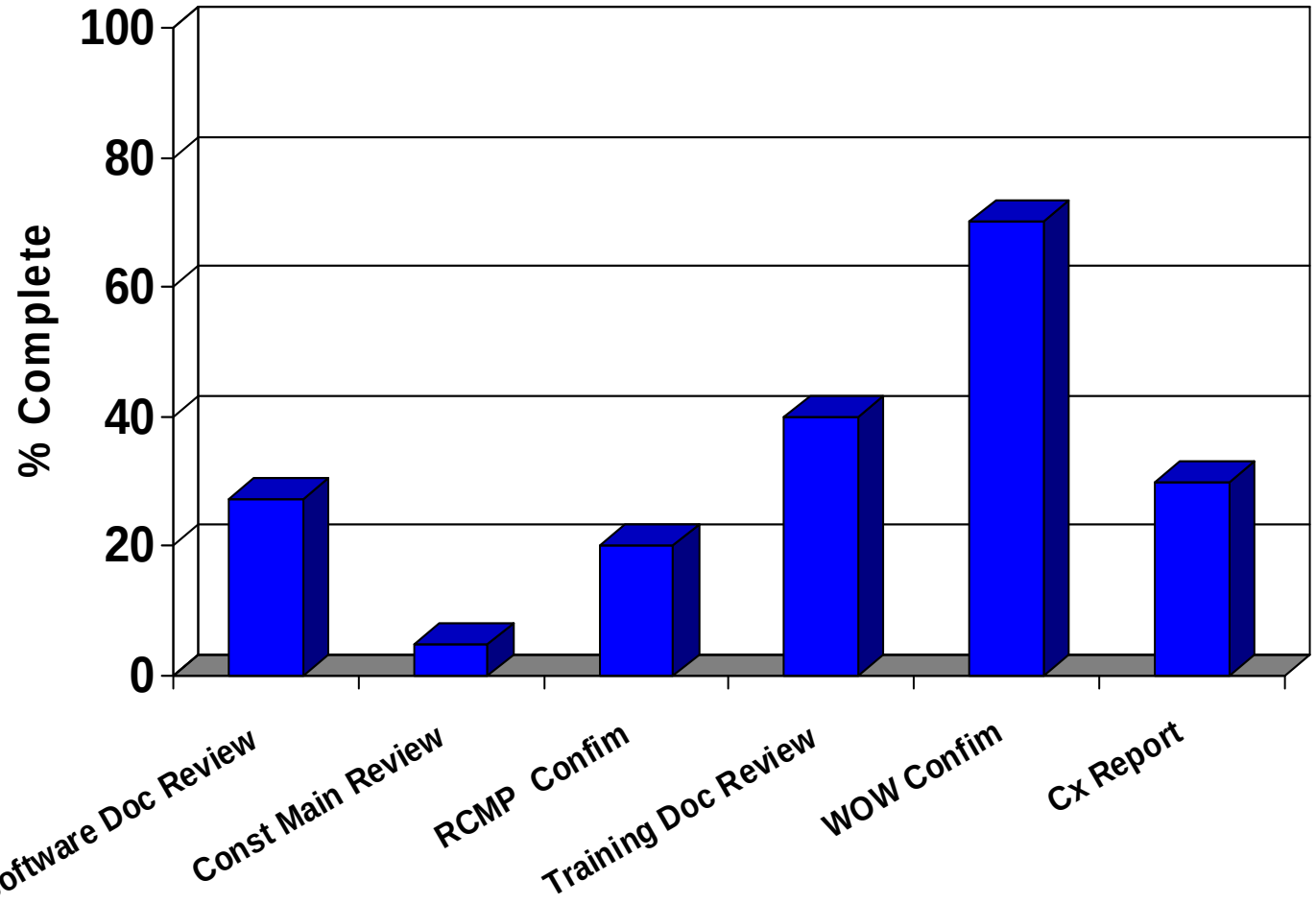
Commissioning Progress
Acceptance & Turnover Phase



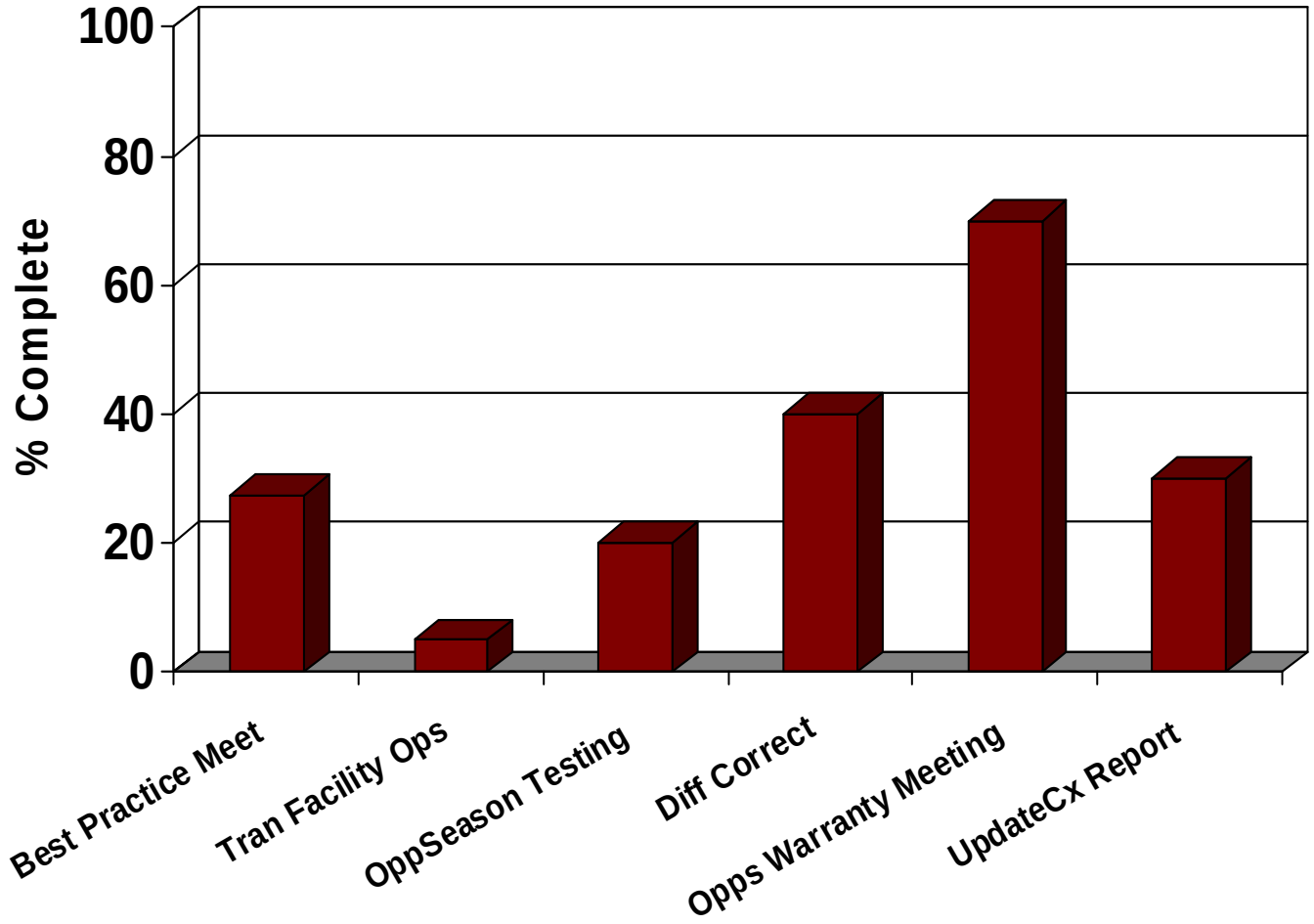
Commissioning Progress
Acceptance & Turnover Phase Cont.



Commissioning Progress
Acceptance & Turnover Phase Cont.



Commissioning Progress
Transition Phase

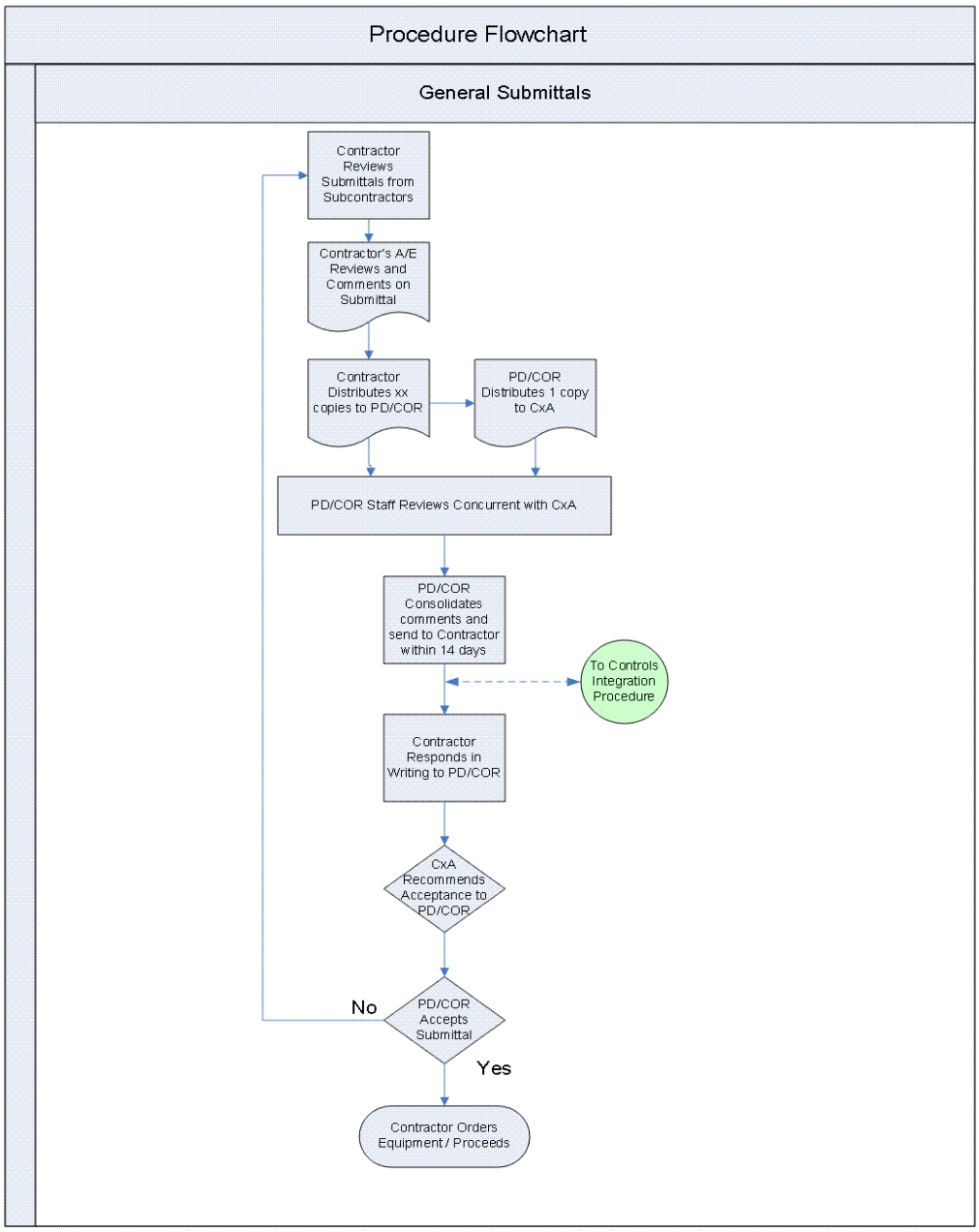


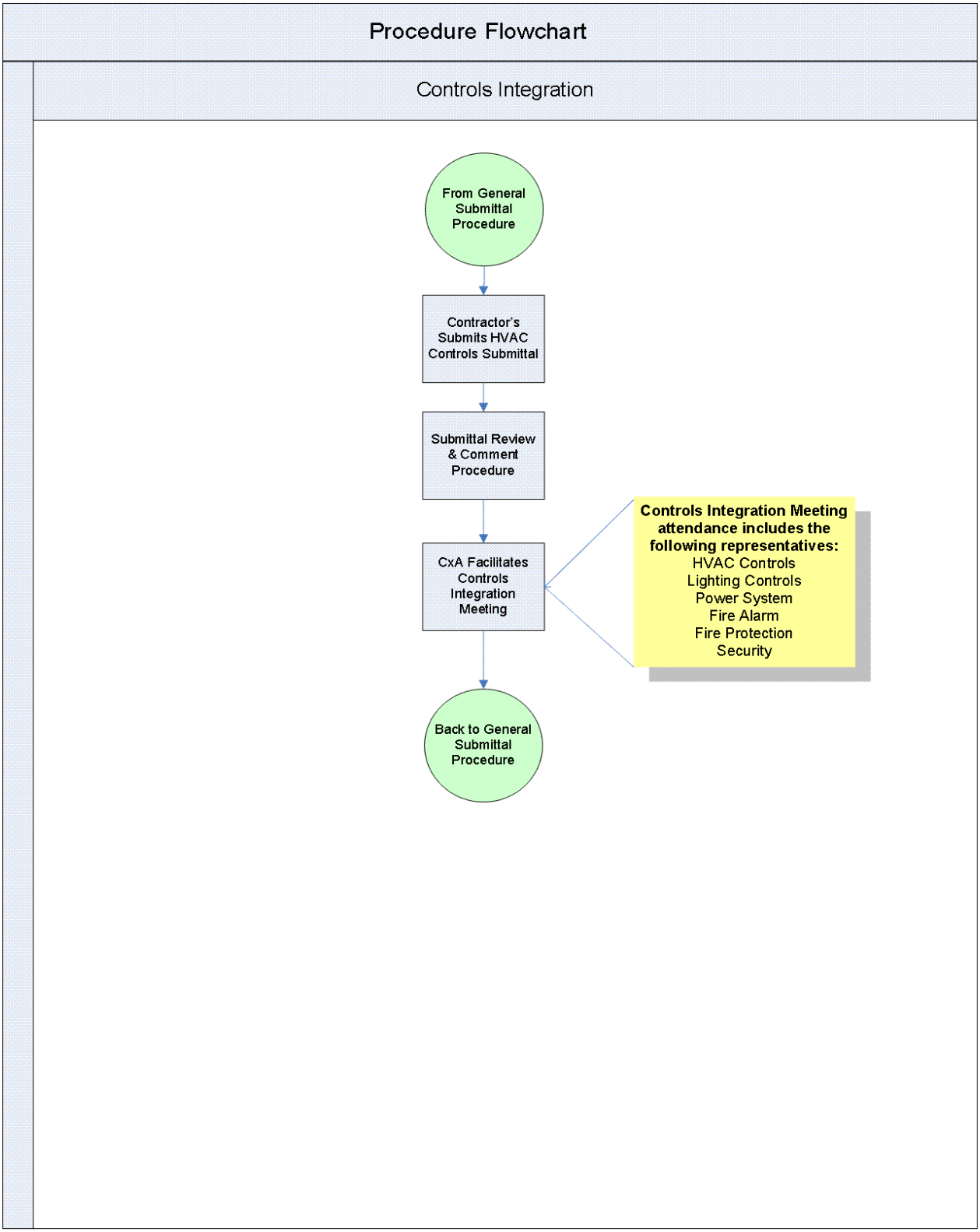
Items Recommended for PD/COR Approval

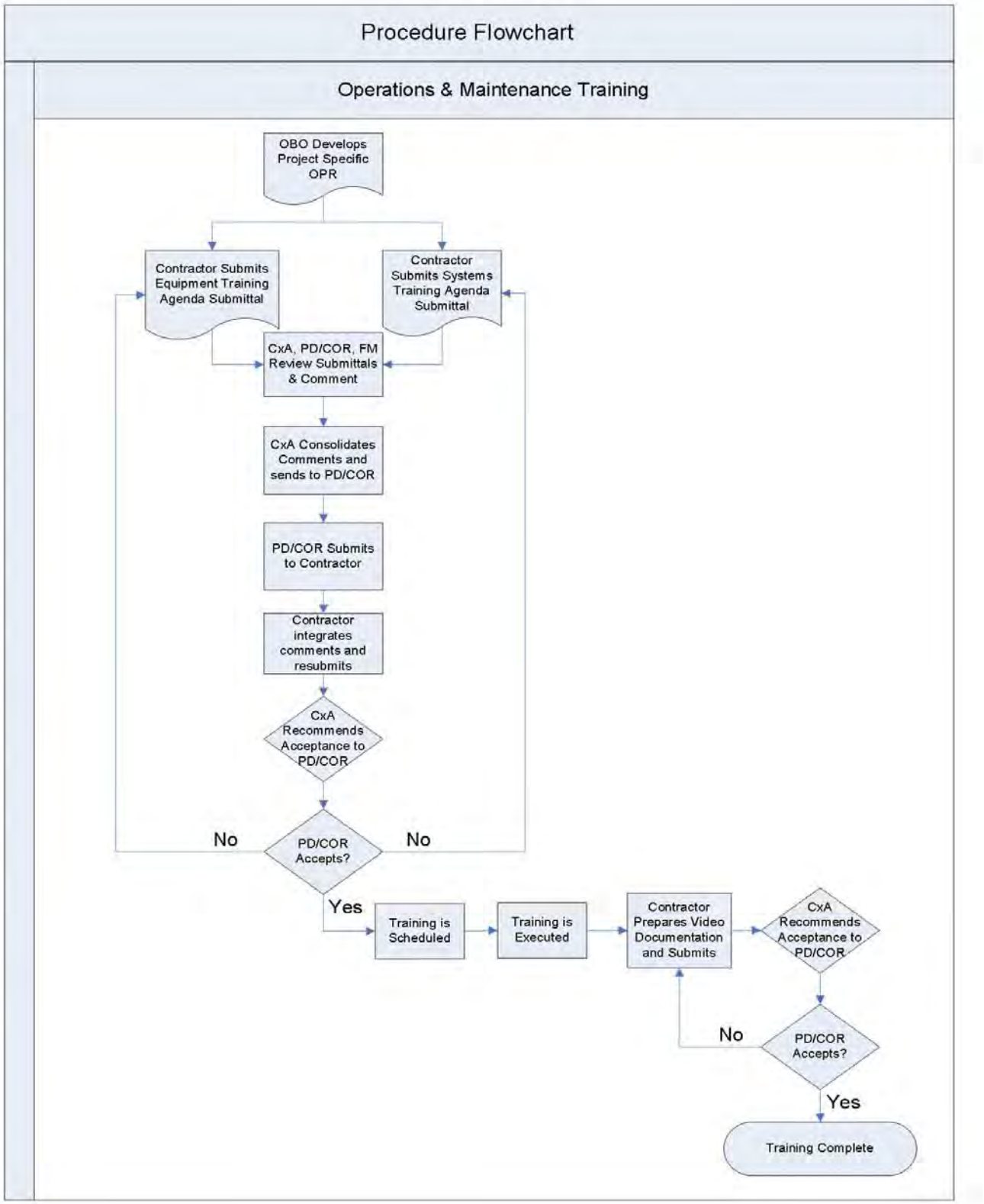
Items Impacting Progress

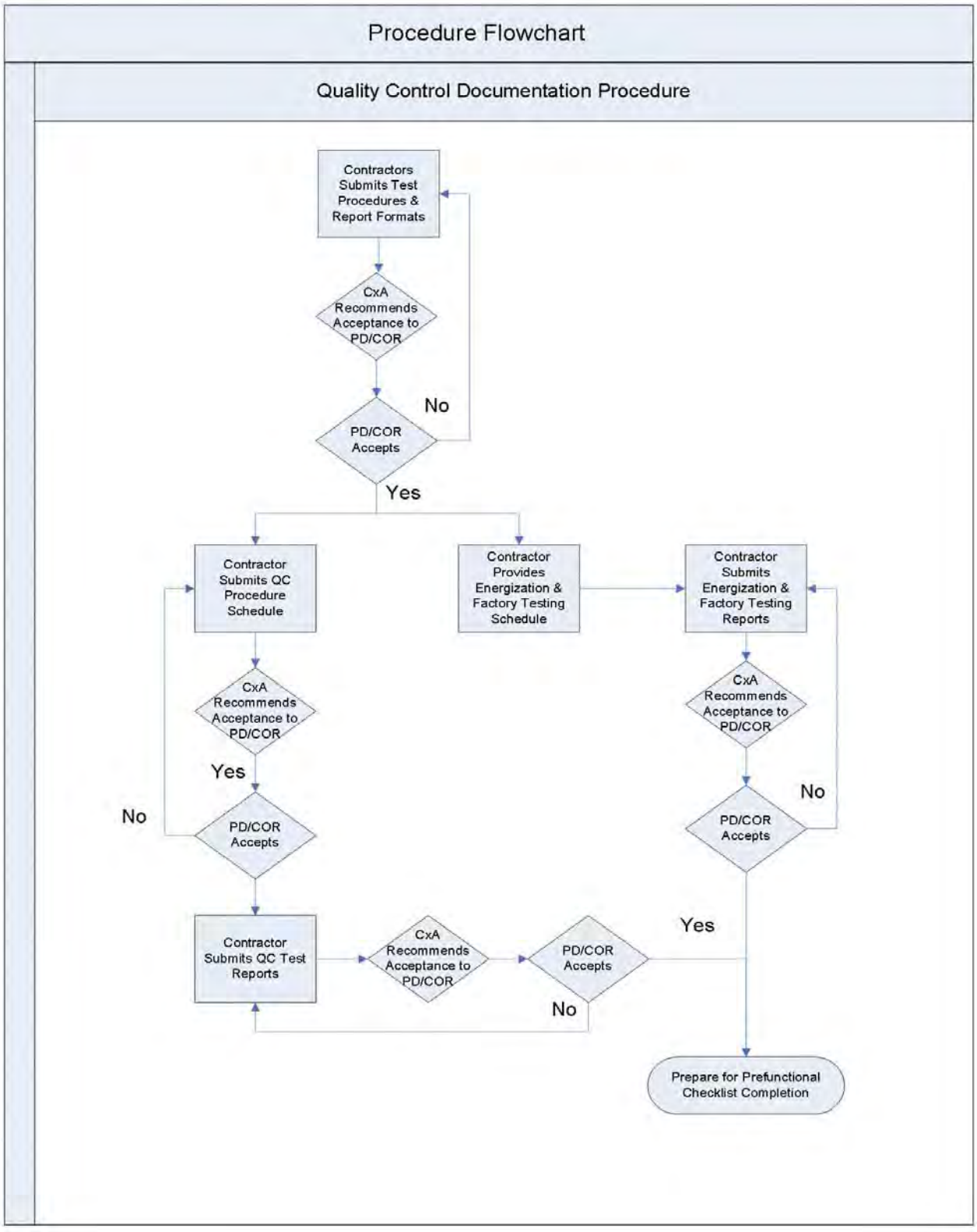
Item	Status / Impact	Party Responsible	Expected Resolution Date

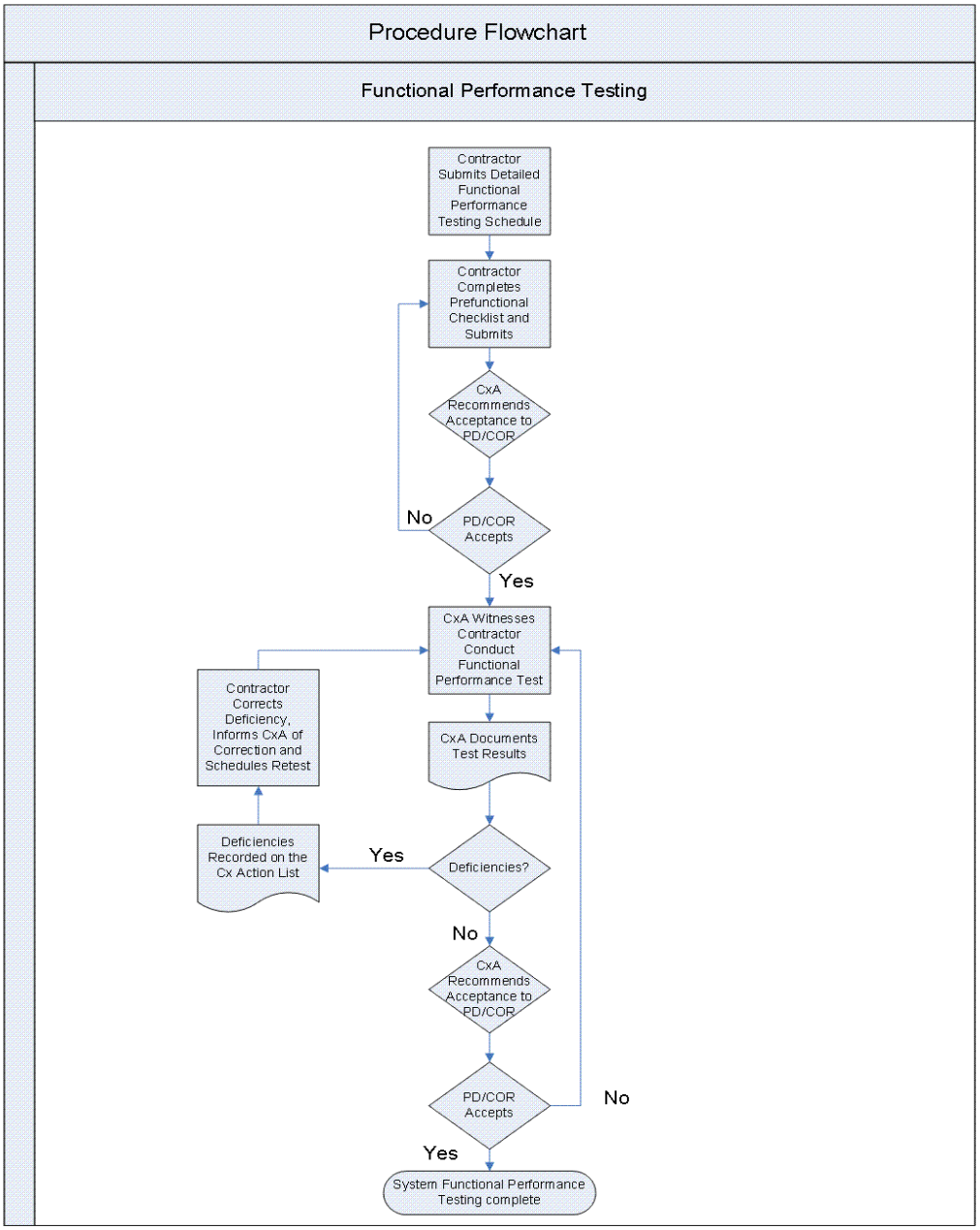
Other Comments


Procedure Flowchart
General Submittals
Contractor Reviews Submittals from Subcontractors
Contractor's A/E Reviews and Comments on Submittal
Contractor Distributes xx copies to PD/COR
PD/COR Distributes 1 copy to CxA
PD/COR Staff Reviews Concurrent with CxA
PD/COR Consolidates comments and send to Contractor within 14 days
To Controls Integration Procedure
Contractor Responds in Writing to PD/COR
CxA Recommends Acceptance to PD/COR
No
PD/COR Accepts Submittal
Yes
Contractor Orders Equipment / Proceeds


Procedure Flowchart
Controls Integration
From General Submittal Procedure
Contractor's Submits HVAC Controls Submittal
Submittal Review & Comment Procedure
CxA Facilitates Controls Integration Meeting
Controls Integration Meeting attendance includes the following representatives:
HVAC Controls
Lighting Controls
Power System
Fire Alarm
Fire Protection
Security
Back to General Submittal Procedure


Procedure Flowchart
Operations & Maintenance Training
OBO Develops Project Specific OPR
Contractor Submits Equipment Training Agenda Submittal
Contractor Submits Systems Training Agenda Submittal
CxA, PD/COR, FM Review Submittals & Comment
CxA Consolidates Comments and sends to PD/COR
PD/COR Submits to Contractor
Contractor integrates comments and resubmits
CxA Recommends Acceptance to PD/COR
PD/COR Accepts?
No
No
Yes
Training is Scheduled
Training is Executed
Contractor Prepares Video Documentation and Submits
CxA Recommends Acceptance to PD/COR
No
PD/COR Accepts?
Yes
Training Complete


Procedure Flowchart
Quality Control Documentation Procedure
Contractors Submits Test Procedures & Report Formats
CxA Recommends Acceptance to PD/COR
No
PD/COR Accepts
Yes
Contractor Submits QC Procedure Schedule
Contractor Provides Energization & Factory Testing Schedule
Contractor Submits Energization & Factory Testing Reports
CxA Recommends Acceptance to PD/COR
Yes
No
PD/COR Accepts
CxA Recommends Acceptance to PD/COR
No
PD/COR Accepts
Contractor Submits QC Test Reports
CxA Recommends Acceptance to PD/COR
PD/COR Accepts
Yes
No
Prepare for Prefunctional Checklist Completion


Procedure Flowchart
Functional Performance Testing
Contractor Submits Detailed Functional Performance Testing Schedule
Contractor Completes Prefunctional Checklist and Submits
CxA Recommends Acceptance to PD/COR
PD/COR Accepts
No
Yes
CxA Witnesses Contractor Conduct Functional Performance Test
Contractor Corrects Deficiency, Informs CxA of Correction and Schedules Retest
CxA Documents Test Results
Deficiencies Recorded on the Cx Action List
Yes
Deficiencies?
No
CxA Recommends Acceptance to PD/COR
PD/COR Accepts
No
Yes
System Functional Performance Testing complete